

TRANSACTIONS
OF THE
AMERICAN SOCIETY OF CIVIL ENGINEERS

**INDEX
VOLUME 120
1955**

**SUBJECT INDEX, PAGE 1583
AUTHOR INDEX, PAGE 1628**

Titles of papers are in quotation marks when given with the
author's name.

AM

TRANSACTIONS

OF THE

AMERICAN SOCIETY OF CIVIL ENGINEERS

INDEX

VOLUME 150

1922

VOLUME 120

SUBJECT INDEX

ACCOUNTS AND ACCOUNTING

*See COSTS . . . ; also subheading
Financing under relative subject*

ADDRESSES

*See AMERICAN SOCIETY OF
CIVIL ENGINEERS—Addresses;
see also under subject of address*

AERATION

*See also HYDRAULIC JUMP;
TANKS, AERATION*

Aeration in composting of refuse, 897,
904, 909, 916.

"Flocculation and Flocculation Basins,"
Thomas R. Camp, 1.

AERATION TANKS

See TANKS, AERATION

AERIAL . . .

See also AIR . . .

AERIAL MAPS AND MAPPING

*See MAPS AND MAPPING, AE-
RIAL*

AERIAL SURVEYS AND SUR- VEYING

*See SURVEYS AND SURVEYING,
AERIAL*

AERODYNAMIC MODELS

See MODELS, AERODYNAMIC

AERODYNAMICS

See also under relative subject

"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, E. F. Kelley, Raymond Archibald, A. A. Jakkula, Raymond Archibald, C. B. McCullough, G. S. Paxson, F. H. Franklin, C. F. Goodrich, Jonathan Jones, C. Earl Webb, Russell G. Cone, Shortridge Hardesty, Charles M. Spofford, O. L. Grover, E. F. Kelley, R. B. McMinn, Leon S. Moisseiff, C. H. Purcell, Norman C. Raab, George D. Whittle, Theodor von Karman, Frank M. Masters, P. L. Pratley, John G. Little, Leon H. Nishkian, R. W. Crum, Franklin N. Wray, Charles C. Sunderland, H. L. Dryden, G. B. Schubauer, O. H. Am-

mann, Elmer K. Timby, Emil H. Praeger, F. B. Farquharson, Charles E. Andrew, Glenn B. Woodruff, and Hardy Cross, 721.

"Wind Velocities during Hurricanes,"
Robert C. Gentry, 169.

AGGREGATES AND AGGREGA- TION

"Flocculation and Flocculation Basins,"
Thomas R. Camp, 1.

"Movements in Structural Concrete in
a Powerhouse," Stanley Moyer and
Viggo Hansen (with discussion),
1183.

AGREEMENTS

See CONTRACTS

AGRICULTURE

*See DRAINAGE; FERTILIZERS
(cross references thereunder);
FLOODS (cross references there-
under); IRRIGATION; LAND
. . . ; SOIL . . .*

AIR . . .

*See also AERIAL . . . (cross refer-
ences thereunder); AERO- . . .*

AIR CHAMBERS

See PIPE LINES

AIRCRAFT

See also AIRPLANE . . .

"Determination of Radii of Curvature
of Taxiways," John H. Jones and
Robert Horonjeff, 27.

AIRFIELDS

See AIRPORTS

AIR FLOW

"Aerodynamic Stability of Suspension
Bridges": 1952 Report of the Advisory
Board on the Investigation of
Suspension Bridges, E. F. Kelley,
Raymond Archibald, A. A. Jakkula,
Raymond Archibald, C. B. McCullough,
G. S. Paxson, F. H. Franklin,
C. F. Goodrich, Jonathan Jones,
C. Earl Webb, Russell G. Cone,
Shortridge Hardesty, Charles M.
Spofford, O. L. Grover, E. F. Kelley,
R. B. McMinn, Leon S. Moisseiff,
C. H. Purcell, Norman C. Raab,

AIR FLOW (Continued)

George D. Whittle, Theodor von Karman, Frank M. Masters, P. L. Pratley, John G. Little, Leon H. Nishkian, R. W. Crum, Franklin N. Wray, Charles C. Sunderland, H. L. Dryden, G. B. Schubauer, O. H. Ammann, Elmer K. Timby, Emil H. Praeger, F. B. Farquharson, Charles E. Andrew, Glenn B. Woodruff, and Hardy Cross, 721.

AIRPLANE PARKING

Passenger and cargo parking requirements at an international airport in relation to basic planning and design, 367.

AIR POLLUTION

See AIR SANITATION (cross reference thereunder)

AIRPORTS (structures and localities)

See also TRAFFIC, AIRPORT

"Determination of Radii of Curvature of Taxicabs," John H. Jones and Robert Horonjeff, 27.

Planning an international airport terminal building, 370.

Summary of building requirements and personnel needs, actual and estimated, at an international airport, 1950-1970, 368.

AIR SANITATION

See ODORS

AIR TERMINALS

See AIRPORTS

AIR TESTING

See AERODYNAMICS

ALINEMENT CURVES

See CURVES (alignement curves)

ALKALIES

See CONCRETE—Alkalies

ALLOYS

See STRESS AND STRAIN—Alloys; *see also* under relative metal, e.g., ALUMINUM

ALLUVIATION

See BARS (alluvia); EROSION . . . ; SEDIMENT AND SEDIMENTATION; SILT AND SILTING . . . ; VALLEYS

ALUMINUM

See also ALLOYS (cross references thereunder)

Eccentrically loaded aluminum alloy columns, 1116.

Testing for plastic strength of rolled rectangular aluminum alloy bars, 1117, 1125.

Welded aluminum in ships and bridge stringers, 115, 140.

AMERICAN SOCIETY OF CIVIL ENGINEERS**Addresses**

1955—Address at the Summer Convention, St. Louis, Mo., June 15, 1955, William R. Glidden, 1550.

Committee Reports—Plasticity

"Plastic Strength of Structural Members": A Symposium, Robert L. Ketter, Edmund L. Kaminsky, and Lynn S. Beedle; Paul P. Bijlaard, Gordon P. Fisher, and George Winter; John W. Clark; and W. Gordon Brady and Daniel C. Drucker (with discussion), 1019.

Committee Reports—Structures (General)

"Plastic Strength of Structural Members": A Symposium, Robert L. Ketter, Edmund L. Kaminsky, and Lynn S. Beedle; Paul P. Bijlaard, Gordon P. Fisher, and George Winter; John W. Clark; and W. Gordon Brady and Daniel C. Drucker (with discussion), 1019.

Memoirs of Members. *See* name of member in Author Index. (See also p. 1557)

ANALYSIS, DESIGN

See under relative subject, e.g., WATER HAMMER

ANALYSIS OF DATA

See EQUATIONS; GRAPHICAL CHARTS (cross references thereunder); MATHEMATICS; PROBABILITY, THEORY OF; STRUCTURES, THEORY OF; also under relative subject, e.g., SOILS

ANALYSIS, STRUCTURAL

See EQUATIONS; STRESS AND STRAIN; STRUCTURES, THEORY OF . . .

ANEMOMETERS

See WIND MEASURING INSTRUMENTS

APPARATUS

See under relative subject, e.g., WELLS; also INSTRUMENTS (cross references thereunder); also under general types of apparatus

APPARATUS, TRIAXIAL COMPRESSION

See SOILS—Tests and Testing

AQUIFERS

See WELLS

ARCHIT

TU

See typ

e.g.

ARCHIT

See M

(cro

ASSOC

See SO

ATMOS

See A

ence

ATMOS

"Wind

Rob

AUTH

See M

AUTO

See M

BACKV

"Back

Con

ROL

993.

"Back

Inte

Her

Fra

Ric

and

Comp

bac

Short

wat

Table

ing

cul

BACT

Bacte

com

BAFF

See V

BANK

TI

See

PP

the

BARC

int

BAR

Inve

co

ch

19

ARCHITECTS AND ARCHITECTURE

See type of structure or structural part,
e.g., BRIDGES; BUILDINGS

ARCHITECTURE, NAVAL

See NAVAL ARCHITECTURE
(cross reference thereunder)

ASSOCIATIONS

See SOCIETIES, TECHNICAL

ATMOSPHERIC POLLUTION

See AIR SANITATION (cross reference thereunder)

ATMOSPHERIC PRESSURE

"Wind Velocities during Hurricanes,"
Robert C. Gentry, 169.

AUTHORITIES

See MUNICIPAL AUTHORITIES

AUTOMOBILE . . .

See MOTOR . . . (cross references thereunder)

BACKWATER

"Backwater Effects of Open-Channel Constrictions," Hubert J. Tracy and Rolland W. Carter (with discussion), 993.

"Backwater Functions by Numerical Integration," Clint J. Keifer and Henry H. Chu, 429. *Discussion:* Francis F. Escoffier; Henry J. Miles; Richard Silvester; and Clint J. Keifer and Henry H. Chu, 443.

Computing of a sketch of a typical backwater flow, 985.

Short cut method of computing backwater depths, 1011.

Tables of functions to facilitate computing of water surface profiles in circular conduits, 429, 443.

BACTERIA

Bacterial decomposition as related to composting processes, 897, 910, 917.

BAFFLES

See WATER, FLOW OF . . .

BANKS AND BANK PROTECTION, RIVER

See RIVER BANKS AND BANK PROTECTION (cross references thereunder)

BARGES

Bridge erection by floating the spans into position, 249.

BARS (alluvia)

Investigations of increased shoaling conditions in inner harbor navigation channels, Charleston, South Carolina, 1948-1953, 687, 689, 695.

"Sediment Sampling in Tidal Waterways," Edward A. Schultz, 687.

BASINS (depression in earth's surface)

See DRAINAGE; VALLEYS; *see also* RIVER BASINS (cross references thereunder)

BASINS, FLOCCULATION

See FLOCCULATION BASINS (cross references thereunder)

BASINS, SETTLING (water supply)

See SETTLING BASINS

BEACHES

See SAND DUNES

BEAMS (General)

See also BRIDGES; BUCKLING; CONNECTORS AND CONNECTIONS (cross references thereunder); FLANGES (cross reference thereunder); GIRDERS . . . (cross references thereunder); STRESS AND STRAIN—Beams (General); STRUCTURES, THEORY OF—Beams and Girders (General); TORSION; WHEEL LOADS

"Deflections of a Circular Beam Out of Its Initial Plane," Enrico Volterra, 65. *Discussion:* I. Oesterblom, and Enrico Volterra, 87.

Effect of coped holes in web of beams and resultant cracking tendencies, 120, 121.

"Impulsive Motion of Elasto-Plastic Beams," Hans H. Bleich and Mario G. Salvadori (with discussion), 499.

"Inelastic Behavior of Reinforced Concrete Members," Lawrence H. N. Lee (with discussion), 181.

Stringer detail design in long span bridges, 221.

Bibliography

Circular beams on elastic foundations, 309.

Deflections of circular beams, 84, 87, 88, 91.

BEAMS, CONTINUOUS

See also STRESS AND STRAIN—Beams, Continuous

"Constrained Circular Beams on Elastic Foundations," Enrico Volterra and Randall Chung, 301.

"Lateral Buckling of I-Beams," Mario G. Salvadori (with discussion), 1165.

"Stress Measurements, San Leandro Creek Bridge," Ray W. Clough and Charles F. Scheffey, 939.

BEARING CAPACITY (foundations, rocks, soils)

For more general interpretation *see* cross references under **LOAD**

"Reduction in Soil Strength with Increase in Density," Charles R. Foster, 803. *Discussion:* Edward S. Barber, George R. Halton, and Charles R. Foster, 816.

"Strength Characteristics of Compacted Clays," Gerald A. Leonards (with discussion), 1420.

"The Undisturbed Consolidation Behavior of Clay," John H. Schmittmann (with discussion), 1201.

BED LOAD

See CHANNELS; SILT AND SILTING . . . ; TURBULENCE; WATER, FLOW OF, IN OPEN CHANNELS

BENDING

See BUCKLING; MOMENTS; STRESS AND STRAIN; *also* under relative structure, structural part or material, e.g., BEAMS; CONCRETE

BIBLIOGRAPHY

See subheading Bibliography under relative subject. (Comprehensive bibliographical footnotes existing in individual papers in which books and other material are cited)

BIOGRAPHIES OF DECEASED MEMBERS

See cross reference under **MEMOIRS OF DECEASED MEMBERS.**

(*See also* p. 1557)

BOGS

See MARSHES; PEAT

BOLTED JOINTS

See JOINTS, BOLTED (cross reference thereunder)

BOLTS

See JOINTS

BORINGS

"Sand Compaction by Vibroflotation," Elio D'Appolonia, Callix E. Miller, Jr., and Thomas M. Ware, 154.

BOUNDARIES (land ownership)

See RIGHTS OF WAY (land strips)

BOUNDARY LAYER, THEORY OF (fluid flow)

See FLUIDS, FLOW OF (cross references thereunder); WATER, FLOW OF . . .

BOW GIRDERS

See GIRDERS

BRACING

See TRUSSES . . .

BREAKWATERS

See WATER PRESSURE; WAVES

BRIDGE CABLES

Construction of suspension spans, Chesapeake Bay Bridge, 251.

BRIDGE FAILURES

See FAILURES, BRIDGE

BRIDGE PIERS

See also CONCRETE

Computing backwater from channel obstructions caused by bridge piers, 1007, 1008, 1013.

BRIDGES (General)

See also BEAMS . . . ; COLUMNS; COSTS, BRIDGE; FAILURES, BRIDGE; GIRDERs; MASONRY (cross reference thereunder); STRESS AND STRAIN—Bridges; STRUCTURES, THEORY OF—Bridges; TRUSSES . . . ; VIBRATION; WATER, FLOW OF, IN OPEN CHANNELS; WHEEL LOADS

"Chesapeake Bay Bridge," Ethan F. Ball, 245.

Requirements for weldable bridge steel, 108, 116.

BRIDGES, GIRDER

"Erection of Main River Span, Passaic River Bridge," Jonathon Jones, 208.

Failures of welded bridges in Canada, 132, 135, 144.

"Stress Measurements, San Leandro Creek Bridge," Ray W. Clough and Charles F. Scheffey, 939.

BRIDGES, MOVABLE (LIFT)

Origination of the double lift bridge, 1558

BRIDGES, SUSPENSION

See also STRESS AND STRAIN—Bridges, Suspension

"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, E. F. Kelley, Raymond Archibald, A. A. Jakkula, Raymond Archibald, C. B. McCullough, G. S. Paxson, F. H. Franklin, C. F. Goodrich, Jonathan Jones, C. Earl Webb, Russell G. Cone, Shortridge Hardesty, Charles M. Spofford, O. L. Grover, E. F. Kelley, R. B. McMinn, Leon S. Moisseiff, C. H. Purcell, Norman C. Raab, George D. Whittle, Theodor von

BRIDGES

Ka

Fra

Nis

Wi

Dr

An

Pr

E.

Ha

Flut

cill

76

Neg

brin

744

Weig

Bibliog

Bibli

brin

BRID

Sec

Br

BUCK

Inter

the

11

"Lat

G.

er

an

"Pla

bu

Ka

an

B

G

W

D

BUI

See

BUI

See

T

C

R

S

T

Bui

b

i

Eve

BRIDGES, SUSPENSION (Cont.)

Karman, Frank M. Masters, P. L. Pratley, John G. Little, Leon H. Nishkian, R. W. Crum, Franklin N. Wray, Charles C. Sunderland, H. L. Dryden, G. B. Schubauer, O. H. Ammann, Elmer K. Timby, Emil H. Praeger, F. B. Farquharson, Charles E. Andrew, Glenn B. Woodruff, and Hardy Cross, 721.

Flutter theory as related to bridge oscillation problems, 742, 744, 751, 758, 762.

Negative slope theory as related to bridge oscillation problems, 729, 739, 744, 748.

Weight in relation to vibration, 760, 767.

Bibliography

Bibliography on stability of suspension bridges, 768.

BRIDGES, TRUSS

See STRESS AND STRAIN—Bridges, Truss; TRUSSES . . .

BUCKLING

Interaction curves for I-beams under thrust and end moments, 1170, 1172, 1173, 1178.

"Lateral Buckling of I-Beams," Mario G. Salvadori, 1165. *Discussion:* Robert V. Whitman, Michael R. Horne, and Mario G. Salvadori, 1178.

"Plastic Strength of Structural Members": A Symposium, Robert L. Ketter and Edmund L. Kaminsky, and Lynn S. Beedle; Paul B. Bijaard, Gordon P. Fisher, and George Winter; John W. Clark; and W. Gordon Brady and Daniel C. Drucker (with discussion), 1019.

BUILDING (process)

See CONSTRUCTION

BUILDING MATERIALS

See MATERIALS OF CONSTRUCTION

BUILDINGS

See also EARTHQUAKES; FAILURES, BUILDING; FOUNDATIONS . . .; MATERIALS OF CONSTRUCTION; ROOFS AND ROOFING; STRESS AND STRAIN . . .; STRUCTURES, THEORY OF . . .; also under type of building, e.g., AIRPORTS

Buildings in the United States using bolt connectors in lieu of rivets, 1395, 1398.

Evolution of the taller building, 147.

BUILDING STONE

See STONE (cross references thereunder)

BULKHEADS

See also RETAINING WALLS; WAVES

Usage of bulkheads to combat landslides, 286.

BULKHEAD WALLS

See RETAINING WALLS

BUTTERFLY VALVES

See VALVES

CABLES, BRIDGE

See BRIDGE CABLES

CANALS (General)

See also CHANNELS; EROSION, STREAM; IRRIGATION CANALS; SEDIMENT AND SEDIMENTATION; SILT AND SILTING, CHANNEL; WATER, FLOW OF, IN OPEN CHANNELS; WATER TRANSPORTATION; WATERWAYS; WAVES

CANALS (Geographical)

Illinois Waterway. *See* WATERWAYS (Geographical)—Illinois Waterway

United States

"Some Economic Aspects of Waterway Projects," Haywood R. Faison (with discussion), 1480.

CANALS, IRRIGATION

See IRRIGATION CANALS

CARRIERS

See AIRCRAFT; MOTOR . . . (cross references thereunder); RAIL . . .; RATE MAKING; TRANSPORTATION (cross references thereunder); WATER . . .

CARS

See MOTOR VEHICLES (cross references thereunder)

CARTOGRAPHY

See CHARTS (cross references thereunder); MAPS AND MAPPING; SURVEYS AND SURVEYING

CAR WHEELS

See WHEEL LOADS

CAVITATION

"Applications of the Relaxation Technique in Fluid Mechanics," John S. McNow, En-Yun Hsu and Chia-Shun Yih (with discussion), 650.

"Hydraulic Model Studies of Martin Dam Draft Tubes," Carl E. Kinds-vater and Richard R. Randolph, Jr., (with discussion), 1399.

CHAMBERS, AIR*See PIPE LINES***CHANNELS (waterways)**

See also EROSION, STREAM; HYDRAULIC JUMP; RIVERS; SILT AND SILTING, CHANNEL; WATER, FLOW OF, IN OPEN CHANNELS

"Design of Stable Channels," Emory W. Lane, 1234. *Discussion:* Serge Leliavsky; A. Nizery and G. Braudeau; N. K. Bose; Jose S. Gandolfo; and Emory W. Lane, 1261.

Effects of bends in stable channel design, 1256, 1259.

CHARTS

See GRAPHICAL CHARTS (cross references thereunder); see also MAPS AND MAPPING . . .; also under relative subject, e.g., WATER HAMMER

CIRCULAR BEAMS*See BEAMS***CITIES**

See also AIRPORTS; BUILDINGS; CITY PLANNING; COSTS . . .; EMPLOYEES AND EMPLOYMENT; ENGINEERS AND ENGINEERING—Government Relationships; GAS AND GASWORKS . . .; INDUSTRIAL . . .; MUNICIPAL . . .; ODORS; PARKING . . . (cross reference thereunder); PUBLIC HEALTH; REFUSE DISPOSAL; SEWAGE . . .; SEWERS; TRAFFIC . . .; also geographical subheadings under relative subject, e.g., HARBORS—Charleston, S. C.

"Community and Neighborhood Development," Russell H. Riley, 449.

Importance of waterway development in the Kansas City, Missouri area, 1528, 1531, 1546.

CITY PLANNING (General)

See also EDUCATION; HIGHWAYS AND ROADS

Noteworthy examples of neighborhood planning and development in the United States, 453.

Remedies suggested for the restoration and improvement of the older neighborhood, 452.

"The Training of City Planners," Howard K. Menninick (with discussion), 608.

CITY PLANNING (Geographical)**Florida**

"Community and Neighborhood Development," Russell H. Riley, 449.

West Palm Beach, Fla.

"Community and Neighborhood Development," Russell H. Riley, 449.

CIVIL ENGINEERS AND ENGINEERING

See AMERICAN SOCIETY OF CIVIL ENGINEERS; ENGINEERS AND ENGINEERING (and cross references thereunder)

CLASSIFICATION OF SOILS

See SOILS—Classification

CLAY

See also SHEAR; SOILS

"Reduction in Soil Strength with Increase in Density," Charles R. Foster (with discussion), 803.

"Strength Characteristics of Compacted Clays," Gerald A. Leonards, 1420. *Discussion:* Harold J. Gibbs and Jack W. Hill; James K. Mitchell; Preston T. Bennett and Paul E. Wohlt; and Gerald A. Leonards, 1455.

"The Undisturbed Consolidation Behavior of Clay," John H. Schmertmann (with discussion), 1201.

Bibliography

List of references on the strength characteristics of compacted soils, including clays, 1452.

COAGULANTS AND COAGULATION

See WATER TREATMENT

COFFERDAMS

Forty-five foot rock excavation with rock slide problems as undertaken at Hales Bar Hydroelectric Plant, in Tennessee, 555, 559.

COLLEGES AND SCHOOLS, ENGINEERING

See EDUCATION

COLUMNS

See also STRESS AND STRAIN—Columns; STRUCTURES, THEORY OF—Columns

"Inelastic Behavior of Reinforced Concrete Members," Lawrence H. N. Lee (with discussion), 181.

"Lateral Buckling of I-Beams," Mario G. Salvadori (with discussion), 1165.

COMM

See AIR; NELSON; HANSON; POPULATION; thereunder; POETRY

COMM

See AIR; CIVIL; Report; report

COMP

See BUSINESS; COMP

See BUSINESS; DIS

COMP

See STATION; COMP

See C; COMP

See STATION; COMP

CONC

See AIR; GR

CR; SEL; AN; TU; Reinc

Moving; a H; Vig; E. mem; Han

Alkalies

Moving; a H; Vig; 118;

Constr; Instal; dra; ban

Effect; "Str; Cre; Ch

Expans; Map; Un

cre

COMMERCE

See AIRPORTS; CANALS; CHANNELS; CITIES; FREIGHT; HARBORS; RIVERS; TRANSPORTATION (cross references thereunder); WATER TRANSPORTATION; WATERWAYS

COMMITTEE REPORTS

See AMERICAN SOCIETY OF CIVIL ENGINEERS—Committee Reports; *see also* under subject of report

COMPACTION

See BEARING CAPACITY; SOILS

COMPOST AND COMPOSTING

See under type of waste, e.g., REFUSE DISPOSAL; *see also* BACTERIA

COMPRESSION

See STRESS AND STRAIN

COMPRESSION MEMBERS

See COLUMNS

COMPRESSION TESTS, SOIL

See SOILS—Tests and Testing

CONCRETE (General)

See also AGGREGATES AND AGGREGATION; FAILURES, CONCRETE; GRAVEL; SAND; SEEPAGE; SLABS; STRESS AND STRAIN—Concrete; STRUCTURES, THEORY OF—Concrete, Reinforced; *also* under special structure or structural part

"Movements in Structural Concrete in a Powerhouse," Stanley Moyer and Viggo Hansen, 1183. *Discussion:* E. A. Woodhead; Herbert A. Kammer; and Stanley Moyer and Viggo Hansen, 1193.

Alkalies

"Movements in Structural Concrete in a Powerhouse," Stanley Moyer and Viggo Hansen (with discussion), 1183.

Construction

Installation of pyramids in Martin Dam draft tubes, Tallapoosa River, Alabama, 1416.

Effect of Natural Processes

"Stress Measurements, San Leandro Creek Bridge," Ray W. Clough and Charles F. Scheffey, 939.

Expansion and Contraction

Map indicating location of structures in United States where expansive concrete exists, 137.

"Movements in Structural Concrete in a Powerhouse," Stanley Moyer and Viggo Hansen (with discussion), 1183.

Special shrinkage problems relating to long-span cylindrical shell roofs, 637, 640, 644, 645.

Linings. *See* under structure, e.g., TUNNEL LININGS

Plastic Flow

"Inelastic Behavior of Reinforced Concrete Members," Lawrence H. N. Lee (with discussion), 181.

Shrinkage. *See* Expansion and Contraction (hereunder)

Slabs. *See* SLABS

Temperature

"Movements in Structural Concrete in a Powerhouse," Stanley Moyer and Viggo Hansen (with discussion), 1183.

Tests and Testing

"Inelastic Behavior of Reinforced Concrete Members," Lawrence H. N. Lee, 181. *Discussion:* Boris Bresler, Alfred J. Ashdown, and Lawrence H. N. Lee, 203.

CONCRETE-METAL

See cross reference under REINFORCED CONCRETE

CONCRETE, REINFORCED

See CONCRETE . . .

CONDUITS

See also FLUMES; PENSTOCKS; PIPE LINES; TUNNELS . . .

"Backwater Functions by Numerical Integration," Clint J. Keifer and Henry H. Chu (with discussion), 429.

"Flow in Rough Conduits," Henry M. Morris, Jr. (with discussion), 373.

"High-Velocity Tests in a Penstock," Maxwell F. Burke (with discussion), 863.

CONNECTORS AND CONNECTIONS

See JOINTS . . . ; WELDS AND WELDING

CONSOLIDATION TESTS, SOIL

See SOILS—Tests and Testing

CONSTRICKTION

See WATER, FLOW OF, IN OPEN CHANNELS

CONSTRUCTION

See also BUILDINGS; CONCRETE—Construction; CONTRACTS;

CONSTRUCTION (Continued)

COSTS . . . ; CURVES (alignment curves); FAILURES . . . ; INSPECTORS AND INSPECTION (cross reference thereunder); MATERIALS OF CONSTRUCTION; SOILS—Construction: SPECIFICATIONS; STRESS AND STRAIN . . . ; STRUCTURES, THEORY OF . . . ; also under type of construction, e.g., BRIDGES; TUNNELS

"Chesapeake Bay Bridge," Ethan F. Ball, 245.

Installation of pyramids in Martin Dam draft tubes, Tallapoosa River, Alabama, 1416.

"Structural Observations of the Kern County Earthquake," Henry J. Degekolb, 1280.

Value of construction roadway requirement in contracts, 223.

"Welded Structures": A Symposium, Simon A. Greenberg, La Motte Grover, and C. L. Kreidler (with discussion), 103.

CONSTRUCTION CURVES

See CURVES (alignment curves)

CONSTRUCTION MATERIALS

See MATERIALS OF CONSTRUCTION

CONSTRUCTION, UNDERWATER

See UNDERWATER CONSTRUCTION (cross reference thereunder)

CONTINUOUS BEAMS

See BEAMS, CONTINUOUS

CONTINUOUS FRAMES

See STRUCTURES, THEORY OF—Frames, Continuous

CONTINUOUS GIRDERS

See GIRDERS, CONTINUOUS (cross reference thereunder)

CONTINUOUS STRUCTURES

See STRUCTURES, THEORY OF

CONTRACTION

See under relative subject, e.g., CONCRETE—Expansion and Contraction; WATER, FLOW OF, IN OPEN CHANNELS

CONTRACTS

See also SPECIFICATIONS

Securing and preliminaries of fulfilling a structural steel contract, 148.

CONVENTIONS (American Society of Civil Engineers)

See AMERICAN SOCIETY OF CIVIL ENGINEERS—Addresses

COSTS (General)

See also subheading Financing under relative subject

COSTS (of work)

See COSTS . . .

COSTS, BRIDGE

Value of construction roadway requirement in contracts as related to overall erection cost, 223.

COSTS, DAM

Summary of total and itemized costs of changes, additions and improvements at Hales Bar Dam, in Tennessee, 555, 557.

COSTS, FILTRATION PLANT (SEWAGE)

Economical designing of single and two stage biofiltration plants, 823, 834.

COSTS, FLOOD

Flood damage costs as related to open channel constrictions, 1009.

COSTS, HIGHWAY AND ROAD

Turnpike design standards and other features influencing control of cost estimates, 56, 57, 64.

COSTS, INDUSTRIAL PLANT

Plant location selection as related to cost factors, 418.

COSTS, JOINT

Bolt and riveted connections compared, 1390, 1392, 1395, 1397, 1398.

COSTS, LANDSLIDE

Prevention and correction of slides in relation to cost, 289.

COSTS, PUMP AND PUMPING

Pump characteristics in relation to relative cost and performance efficiency by type, 18.

COSTS, RAILROAD TRACK

Reduction of costs by usage of simplified method of transit lining of high speed tracks, 521, 537, 538.

COSTS, REFUSE DISPOSAL

Factors influencing composting costs, 909, 912, 913, 918, 920.

COSTS, SAND COMPACTION

Sand compaction process cost comparisons, 155.

COSTS,
Constr
parti
nicip
844,

COSTS

Welded
110,

COSTS

Buildin
lar

COSTS

See C
TA

COSTS

Most

COSTS

Y

Inexp
met
ing

COSTS

T

Meth
me

ben

COSTS

Radio
gra

COUR

See sub
M.

CRAC

See B

CRAC

P

"Ere

RI

CREE

See S

CUR

See C

CUR

See CUR

CUR

See CUR

CUR

See CUR

CUR

COSTS, SEWAGE DISPOSAL

Construction contract costs (total and partially itemized) for certain municipal authorities in Pennsylvania, 844, 859.

COSTS, STEEL

Welded steel in relation to cost, 104, 110, 111, 128.

COSTS, TANK (SEWAGE TANKS)

Building costs of circular and rectangular tanks compared, 361.

COSTS, TRANSPORTATION

See COSTS, WATER TRANSPORTATION

COSTS, TUNNEL

Most economical type of tunnel, 423.

COSTS, WATER HAMMER ANALYSIS

Inexpensive water hammer analysis method as installed at Tracy Pumping Plant, in California, 697, 715.

COSTS, WATER TRANSPORTATION

Methods of determining cost requirements in relation to ratio of future benefits, 1480.

COSTS, WELD AND WELDING

Radiographic inspection and radiographic plate costs, 243, 244.

COURT DECISIONS

See under relative subject (under the subject law heading, e.g., RATE MAKING LAW)

CRACKS AND CRACKING

See under relative subject, e.g., BEAMS (General)

CRANES, DERRICKS AND POWER SHOVELS

"Erection of Main River Span, Passaic River Bridge," Jonathan Jones, 208.

CREEP

See STRESS AND STRAIN; STRUCTURES, THEORY OF

CURRENT METERS

See METERS AND METERING, CURRENT

CURRENTS

See TIDES; WAVES

CURVED BEAMS

See BEAMS

CURVED STRUCTURES

See STRUCTURES, THEORY OF—Curved Structures

CURVES (alignment curves)

"Determination of Radii of Curvature of Taxiways," John H. Jones and Robert Horonjeff, 27.

Solution of compound curves by simultaneous equations, 532.

"Transit Lining of High-Speed Track," Neil R. Berndt, 521. *Discussion:* Harry Rubey, 538.

CURVES (backwater)

See BACKWATER

CURVES (construction curves)

See CURVES (alignment curves)

CURVES (design curves)

See under relative subject of design, e.g., BUCKLING; STRUCTURES (General)

CURVES (elastic curves)

See STRUCTURES, THEORY OF

CURVE TANGENTS

See RAILROAD TRACKS

CYLINDRICAL SHELLS

See STRUCTURES, THEORY OF—Shell Structures

DAMPING

See STRESS AND STRAIN; STRUCTURES, THEORY OF

DAMS (General)

See COFFERDAMS; COSTS, DAM; FOUNDATIONS, DAM; LOCKS; MODELS, HYDRAULIC; WATER PRESSURE

DEFENSE

See NATIONAL DEFENSE

DEFINITIONS

See TERMINOLOGY

DEFLECTIONS

See STRESS AND STRAIN; STRUCTURES, THEORY OF . . . ; *see also* under relative structure or structural part, e.g., BEAMS; GIRDERS

DEFORMATION

See FAILURES . . . ; STRESS AND STRAIN; STRUCTURES, THEORY OF; *also* under type of material, e.g., CONCRETE; *also* under specific type of stress, e.g., BUCKLING, TORSION; *also* under type of structure, e.g., BRIDGES

DEFORMATION, THERMAL

See TEMPERATURE

DERRICKS

See CRANES, DERRICKS AND POWER SHOVELS

DESIGN

See under relative subject, e.g., CHANNELS; PUMPS AND PUMPING; *see also* SPECIFICATIONS; STRUCTURES, THEORY OF

DESIGN ANALYSIS

See under relative subject, e.g., WATER HAMMER

DESIGN CURVES

See CURVES (design curves) (cross reference thereunder)

DIAGRAMS

See GRAPHICAL CHARTS (cross references thereunder); *see also* under relative subject

DIESEL ENGINES

See ENGINES

DIFFUSER FLOW

See DRAFT TUBES

DISCHARGE

See WATER, FLOW OF . . .

DISCHARGE COEFFICIENTS

See under relative subject, e.g., WATER, FLOW OF, IN OPEN CHANNELS

DISTORTION

See STRESS AND STRAIN; TORSION

DRAFT TUBES

"Hydraulic Model Studies of Martin Dam Draft Tubes," Carl E. Kindsvater and Richard R. Randolph, Jr., 1399. *Discussion:* Richard S. Woodruff; and Carl E. Kindsvater and Richard R. Randolph, Jr., 1416.

DRAINAGE

See also SEWERS; WELLS

Drainage of ground water in landslides, 283, 285, 288.

"Effect of Well Screens on Flow into Wells," Jack S. Petersen, Carl Rother and Maurice L. Albertson (with discussion), 563.

"Selection and Design of High-Volume, Low-Head Pumps," George F. Snodgrass, 17.

"Total Sediment Load Measured in Turbulence Flume," Paul C. Benedict, Maurice L. Albertson and Donald Q. Matejka (with discussion), 457.

DRAWDOWN

See WELLS

DRAWINGS

See under relative subject

DUNES

See SAND DUNES

DYNAMICS OF FLUIDS

See HYDRODYNAMICS

DYNAMICS OF GASES

See AERODYNAMICS

DYNAMICS OF STRUCTURES

See STRUCTURAL DYNAMICS

EARTH . . .

See also GROUND . . .; LAND . . .; SOIL . . .

EARTH FLOW

See LANDSLIDES

EARTH MOVEMENTS

See EARTHQUAKES; LANDSLIDES

EARTH PRESSURE

"Reduction in Soil Strength with Increase in Density," Charles R. Foster (with discussion), 803.

EARTHQUAKES

See also SEISMOLOGY; STRUCTURES, THEORY OF—Earthquake Problems; VIBRATION

Effect of earthquakes on masonry buildings, 1282.

"Structural Observations of the Kern County Earthquake," Henry J. Degenkolb, 1280.

EARTHS

See SOILS

EARTHWORK

See also DRAINAGE; EMBANKMENTS; FOUNDATIONS . . .; LEVEES (cross reference thereunder)

"Design of Stable Channels," Emory W. Lane (with discussion), 1234.

ECONOMICS

See also CONTRACTS; COSTS . . .; RATE MAKING; *also* under relative subject, subheading Financing

The added traffic theory in railroad economics, 1506.

"Industrial Development in the South," Carl O. Hoyer (with discussion), 411.

"Planning and Operating Turnpikes," Charles M. Noble, 54.

EDUCATION

Attitudes toward standardization of curricula, 344, 345.

EDUCATION (Continued)

Early engineering schools in France and United States, 342.

"Issues in Highway Engineering Education," Harmer E. Davis and Ralph A. Moyer, 340.

Specific curricula recommendations for undergraduate and graduate courses and research and extension programs in highway engineering, 347, 349.

"The Training of City Planners," Howard K. Menhinick, 608. *Discussion:* Jorma J. Salovaara, 613.

ELASTIC CURVES

See CURVES (elastic curves) (cross reference thereunder)

ELASTICITY

See also PHOTOLELASTICITY; PLASTICITY; STRESS AND STRAIN

"Analysis and Tests of a Cylindrical Shell Roof Model," Bruno Thurlmann and Bruce G. Johnston (with discussion), 615.

"Aseismic Design of Firmly Founded Elastic Structures," Lawrence E. Goodman, Emilio Rosenblueth and Nathan M. Newmark, 782.

"Constrained Circular Beams on Elastic Foundations," Enrico Volterra and Randall Chung, 301.

"Impulsive Motion of Elasto-Plastic Beams," Hans H. Bleich and Mario G. Salvadori (with discussion), 499.

ELASTICITY, PHOTO-

See PHOTOLELASTICITY

ELECTRIC POWER PLANTS

See POWER PLANTS

ELECTRONIC INSTRUMENTS

See SURVEYING INSTRUMENTS

EMBANKMENTS

See also LEVEES (cross reference thereunder); SOILS

Embankments on peat foundations, 98.

EMPLOYEES AND EMPLOYMENT

Actual and estimated personnel needs at an international airport, 1950-1970, 368.

Advantages of pneumatic impact wrench in reducing operator's physical effort in joint connector tightening, 1392.

Qualifications testing and duties of automatic and semi-automatic welders and welding inspectors, 238, 239.

Shortage of riveters in United States in relation to need for newer type of joint fasteners, 1391, 1392, 1396.

Turnpike personnel requirements, organization and training, 57, 61, 62, 63, 64.

ENERGY

See AERODYNAMICS; ENGINES; HYDRODYNAMICS; POWER (cross references thereunder); STRUCTURAL DYNAMICS; STRUCTURES, THEORY OF; WATER, FLOW OF, IN OPEN CHANNELS

ENERGY, KINETIC

See DYNAMICS . . . (cross references thereunder)

ENERGY, LOSS OF

See FRICTION; HYDRAULIC JUMP; VALVES; WATER, FLOW OF . . . ; WATER HAMMER

ENGINEERING

See ENGINEERS AND ENGINEERING

ENGINEERING AND WAR

See cross reference under WAR AND ENGINEERING

ENGINEERING BIBLIOGRAPHY

See BIBLIOGRAPHY (cross references thereunder)

ENGINEERING COLLEGES AND SCHOOLS

See EDUCATION

ENGINEERING EDUCATION

See EDUCATION

ENGINEERING GLOSSARIES

See TERMINOLOGY

ENGINEERING HISTORY

See under relative subject, e.g., JOINTS, BOLTED (cross reference thereunder); POWER PLANTS

ENGINEERING MECHANICS

See MECHANICS . . . (cross references thereunder)

ENGINEERING SOCIETIES

See SOCIETIES, TECHNICAL; *see also* AMERICAN SOCIETY OF CIVIL ENGINEERS

ENGINEERS AND ENGINEERING (General)

See also AMERICAN SOCIETY OF CIVIL ENGINEERS. (For memoirs of deceased members, *see* name of member in Author Index.) (See

ENGINEERS AND ENGINEERING (General) (Continued)

also p. 1557; ARCHITECTS AND ARCHITECTURE (cross reference thereunder); CONTRACTS; EDUCATION; EMPLOYEES AND EMPLOYMENT; RESEARCH; SOCIETIES, TECHNICAL; TERMINOLOGY

Government Relationships

Duties of the consulting engineer under trust indentures securing bonds issued by municipal authorities in Pennsylvania, for sewage works construction and operation, 860.

Refutation of allegations of malpractice of the United States Corps of Engineers in relation to waterway projects by former Chief Engineer-Economist of United States Board of Engineers for Rivers and Harbors, 1480.

Philosophy

"Backsights and Foresights—Glimpses Ahead in the Light of History as Directed by Science": Address at the Summer Convention, St. Louis, Missouri, June 15, 1955, William R. Glidden, 1550.

Professional Relationships

Characteristics essential to an engineer's success according to national technical society members, 343.

Responsibility of civil engineer and economist in waterway development, 1480.

ENGINES

See also TURBINES . . .

Powering pumps of varying size with diesel and oil engines, 20.

EQUATIONS

See also under relative subject, e.g., BACKWATER; WATER, FLOW OF . . .

Equations of elasticity for point-isotropic materials, 36.

Integration of partial differential equations (the Laplacian, the Poisson, the biharmonic and other types), by application of relaxation procedure, 651, 661, 667.

Monte Carlo statistical method of solving of partial differential equations, 675.

Usage of Hazen-Williams equation to analyze pipe network velocities for high rates of flow, 894.

ERECTION

See CONSTRUCTION

EROSION (General)

See also CAVITATION

EROSION, FOUNDATION

Apron tests to prevent scour below a dam, 544.

EROSION, STREAM

"Design of Stable Channels," Emory W. Lane (with discussion), 1234.

Forces causing scour, 1237.

ESTIMATES

See COSTS

ESTUARIES

See RIVERS

ETHICS

See ENGINEERS AND ENGINEERING—Professional Relationships

EXCAVATION

See FOUNDATIONS; also under specific substructure, e.g., TUNNELS . . .

EXCAVATORS (machinery)

See CRANES, DERRICKS AND POWER SHOVELS

EXPANSION

See under relative subject, e.g., CONCRETE—Expansion and Contraction

EXPERIMENTS AND EXPERIMENTATION

See LABORATORIES . . . (cross references thereunder); MODELS; TESTS AND TESTING (cross references thereunder); also under material, structure or structural part tested; also under relative subject, e.g., WATER, FLOW OF . . .

EXPLORATION

See BORINGS; EXCAVATION (cross references thereunder); FOUNDATIONS . . .

EXTENSOMETERS

See GAGES, STRAIN

FABRICATION

See under relative subject, e.g., BRIDGES; STEEL; see also CONSTRUCTION

FACT FINDING

See RESEARCH

FACTOR OF SAFETY

See under relative subject

FACTOR, ROUGHNESS

See cross reference under ROUGHNESS FACTOR

FAILURES (General)

See also BEARING CAPACITY; STRESS AND STRAIN; STRUCTURES, THEORY OF; also under relative subject, e.g., BRIDGES . . .

FAILURES, BRIDGE

Determining contributory failure factors in welded girder spans in Canada, 132, 135, 144.

Fatigue failure causes and remedies in floor beam hangers in railway bridges, 1353, 1391.

Official reports of Tacoma Narrows Bridge, Puget Sound, Washington, 721.

FAILURES, BUILDING

Structural observation of earthquake resisting qualities of materials and design deficiencies, 1280.

FAILURES, CONCRETE

"Inelastic Behavior of Reinforced Concrete Members," Lawrence H. N. Lee (with discussion), 181.

FAILURES, JOINT

Fatigue failure causes and remedies in riveted and bolted structural joints, 1353.

Bibliography

Bibliographic sources for results of numerous fatigue tests, 1379.

FAILURES, PLATE

"High-Strength Bolts in Structural Joints": A Symposium, W. C. Stewart; William H. Munse, D. T. Wright, and Nathan M. Newmark; Frank Baron and Edward W. Larson, Jr.; R. A. Hechtmann, D. R. Young, A. G. Chin, and E. R. Savikko; Jack W. Carter, Kenneth H. Lenzen, and Lawrence T. Wyly; and T. R. Higgins and E. J. Ruble (with discussion), 1295.

FAILURES, POWER

Power failure and its transient effects at Tracy Pumping Plant, Central Valley Project, in California, 697.

FAILURES, PUMP AND PUMPING

Effects of power failure at Tracy Pumping Plant, Central Valley Project, in California, 697.

FASTENERS

See BOLTS (cross reference thereunder); CONNECTORS AND CONNECTIONS (cross references thereunder); RIVETS AND RIVETING

FATIGUE

See under relative subject, e.g., STRESS AND STRAIN—Joints; *see also* FAILURES

FERTILIZERS

See COMPOST AND COMPOSTING (cross references thereunder); SEWAGE SLUDGE

FILTERS AND FILTRATION, SEWAGE

See also SEWAGE DISPOSAL; TANKS, SEDIMENTATION (sewage)

"Evaluation of the Performance of Biofiltration Plants," Renville S. Rankin, 823. *Discussion*; Peter Homack, and Renville S. Rankin, 836.

National Research Council formula for biological filtration in plants serving military installations during World War II, 827, 831, 836.

Reduction of biochemical oxygen demand (B.O.D.) in biofiltration plants, and lack of evidence of nitrification, 824, 831, 840.

FILTERS AND FILTRATION, WATER

"Effect of Well Screens on Flow into Wells," Jack S. Petersen, Carl Rohwer and Maurice L. Albertson (with discussion), 563.

FILTRATION PLANTS, SEWAGE

See also COSTS, FILTRATION PLANT (SEWAGE)

Operating data for biofiltration plants, 828.

Operation data for representative single and two stage municipal biofiltration plants, under various climatic conditions, in the United States, 830, 834, 837.

FINANCE

See COSTS . . . ; ECONOMICS; *see also* subheading Financing under relative subject, e.g., HIGHWAYS AND ROADS—Financing; SEWAGE DISPOSAL—Financing

FINITE DIFFERENCES, THEORY OF

See MATHEMATICS

FIRE STREAMS

See WATER, FLOW OF, THROUGH ORIFICES

FLANGES

See STRESS AND STRAIN—Flanges

FLEXURE

See STRESS AND STRAIN; STRUCTURES, THEORY OF

FLOCCULATION BASINS

See SETTLING BASINS (water supply); TANKS, SEDIMENTATION (sewage)

FLOCS AND FLOCCULATION

See AGGREGATES AND AGGREGATION

FLOOD CONTROL

See RESERVOIRS, FLOOD CONTROL

FLOODS (General)

See COSTS, FLOOD; RESERVOIRS, FLOOD CONTROL

FLOOR BEAMS

See BEAMS . . .

FLOW

See AIR FLOW; CONCRETE—Plastic Flow; DIFFUSER FLOW (cross reference thereunder); EARTH FLOW (cross reference thereunder); FLOODS (cross references thereunder); GROUND WATER; LIQUIDS, FLOW OF . . .; NONUNIFORM FLOW (cross reference thereunder); RUNOFF; SEEPAGE; SEWAGE . . .; TURBULENCE; WATER, FLOW OF . . .

FLOW, LAMINAR

See WATER, FLOW OF, IN PIPES

FLOW METERS

See METERS AND METERING; WEIRS (cross references thereunder)

FLOW OF FLUIDS

See GAS . . .; LIQUIDS, FLOW OF; WATER, FLOW OF . . .

FLOW OF LIQUIDS

See LIQUIDS, FLOW OF . . .

FLOW OF OIL

See WELLS

FLOW OF SOLIDS

See SOLIDS, FLOW OF (cross references thereunder)

FLOW OF WATER

See WATER, FLOW OF . . .

FLUID FRICTION COEFFICIENTS

See FRICTION COEFFICIENTS, FLUID

FLUID MECHANICS

See WATER, FLOW OF

FLUIDS, DYNAMICS OF

See HYDRODYNAMICS

FLUIDS, FLOW OF

See GAS . . .; LIQUIDS, FLOW OF; WATER, FLOW OF . . .

FLUMES

See also WATER, FLOW OF, IN OPEN CHANNELS

"Total Sediment Load Measured in Turbulence Flume," Paul C. Benedict, Maurice L. Albertson and Donald Q. Matejka (with discussion), 457.

FLUTTER, THEORY OF

See BRIDGES, SUSPENSION

FLUVIAL MODELS

See MODELS, HYDRAULIC

FOOTINGS

See FOUNDATIONS, BUILDING

FORMULAS

See under relative subject, e.g., STRUCTURES, THEORY OF—Shell Structures

FOUNDATIONS (General)

See also BEARING CAPACITY; BORINGS; COFFERDAMS; EARTH PRESSURE; EARTHQUAKES; EROSION, FOUNDATION; SEEPAGE; SOILS; STRESS AND STRAIN—Foundations; WATER PRESSURE

Interbedded sand and rock foundations, 101.

"Unusual Foundation Conditions in the Everglades," Paul H. Shea, 92.

FOUNDATIONS, BUILDING

"Constrained Circular Beams on Elastic Foundations," Enrico Volterra and Randall Chung, 301.

"Sand Compaction by Vibroflotation," Elio D'Appolonia, Callix E. Miller, Jr., and Thomas M. Ware, 154.

Bibliography

Circular beams on elastic foundations, 309.

FOUNDATIONS, DAM

"Modernization of the Hales Bar Plant," Adolf A. Meyer (with discussion), 539.

FOUNDATIONS, LEVEE

"Unusual Foundation Conditions in the Everglades," Paul H. Shea, 92.

FRAMES (General)

See STRESS AND STRAIN—Frames
See also BEAMS; COLUMNS

FRAMES, CONTINUOUS

See STRUCTURES, THEORY OF—
 Frames, Continuous

FRAMES, RIGID

See STRESS AND STRAIN—
 Frames, Rigid

FRAMEWORKS

See STRUCTURES, THEORY OF
FREIGHT

Actual and estimated air cargo (imports and exports) at Puerto Rico International Airport, at San Juan, 1940-1970, 366.

"Some Economic Aspects of Waterway Projects," Haywood R. Faison (with discussion), 1480.

Ton mileage percentage of freight transported on United States inland waterways, 1504, 1506.

FRICITION

See also TURBULENCE

"Determination of Radii of Curvature of Taxiways," John H. Jones and Robert Horonjeff, 27.

"Flow in Rough Conduits," Henry M. Morris, Jr. (with discussion), 373.

"Motion of Particles on Bed of a Turbulent Stream," Arthur T. Ippen and Ramjee P. Verma, 921.

"Open Channels with Nonuniform Discharge," Wen-Hsiung Li (with discussion), 255.

"Pressure Surges in Pump Installations," John Parmakian (with discussion), 697.

FRICITION COEFFICIENTS, FLUID

"Backwater Effects of Open-Channel Constrictions," Hubert J. Tracy and Rolland W. Carter (with discussion), 993.

"High-Velocity Tests in a Penstock," Maxwell F. Burke (with discussion), 863.

"Motion of Particles on Bed of a Turbulent Stream," Arthur T. Ippen and Ramjee P. Verma, 921.

Pipe friction test data for San Gabriel Dam, in California, 870.

"Tranquil Flow through Open-Channel Constrictions," Carl E. Kindswater and Rolland W. Carter (with discussion), 955.

FUEL

See GAS . . . ; OIL . . . (cross references thereunder)

GAGES (General)

See also METERS AND METERING . . . ; also cross references under INSTRUMENTS

GAGES, PRESSURE

"High-Velocity Tests in a Penstock," Maxwell F. Burke (with discussion), 863.

GAGES, STRAIN

"Stress Measurements, San Leandro Creek Bridge," Ray W. Clough and Charles F. Scheffey, 939.

Usage of Whittemore strain gage, 315, 317.

GAGES, STREAM

"High-Velocity Tests in a Penstock," Maxwell F. Burke (with discussion), 863.

GARBAGE DISPOSAL

See REFUSE DISPOSAL

GAS AND GASWORKS LAW

Early law and interstate control of oil and gas in the United States, 496, 498.

GATES

See under type of gate, e.g., WATER GATES, MOVABLE

GAUGES (measuring instruments)

See GAGES

GEODETIC SURVEYS AND SURVEYING

See SURVEYS AND SURVEYING, GEODETIC

GEOMETRY

See under relative subject, e.g., CURVES (alignement curves); WATER, FLOW OF . . .

GIRDER BRIDGES

See BRIDGES, GIRDER

GIRDERS (General)

See also BEAMS; BRIDGES; STRESS AND STRAIN . . .

"Deflections of a Circular Beam Out of Its Initial Plane," Enrico Volterra (with discussion), 65.

GIRDERS, CONTINUOUS

See BRIDGES, GIRDER

GLOSSARIES

See TERMINOLOGY

GOVERNMENT

See also AUTHORITIES (cross reference thereunder); ENGINEERS AND ENGINEERING—Government Relationships; PUBLIC HEALTH; *also* LAW subject heading under related topic, e.g., SEWAGE DISPOSAL LAW; WATERWAY LAW

"Some Economic Aspects of Waterway Projects," Haywood R. Faison (with discussion), 1480.

GRAPHICAL CHARTS

See NOMOGRAPHS; *also* under relative subject

GRAVEL

See also SAND; SOILS

Analyzing problems of water flow into well screens surrounded by different sized gravel, 563.

GROUND . . .

See also EARTH . . . ; LAND . . . ; SOIL . . .

GROUND MOVEMENTS

See EARTHQUAKES; LAND-SLIDES

GROUND WATER

See also SEEPAGE; WATER SUPPLY

Action of ground water in relation to landslides, 283.

Confined and unconfined percolating water differentiated, 491.

"Effect of Well Screens on Flow into Wells," Jack S. Petersen, Carl Rohwer and Maurice L. Albertson (with discussion), 563.

GROUND WATER LAW

Formation of county water districts in California for protection of land-owners in ground water suits, 494, 498.

"Statutory Control of Ground Water in the Western United States," S. T. Harding, 490.

GROUNDWORK

See EARTHWORK; FOUNDATIONS

GUESTS

See WIND . . .

HARBORS (General)

See also CHANNELS; FREIGHT; TRAFFIC, WATERWAY; WATER TRANSPORTATION; WAVES

HARBORS (Geographical)**Charleston, S. C.**

Investigations of increased shoaling conditions in inner harbor navigation channels, 1948-1953, 687, 689, 695.

HEAD, LOSS OF

See AERATION; FRICTION; WATER, FLOW OF . . .

HEALTH, PERSONAL

See EMPLOYEES AND EMPLOYMENT

HEALTH, PUBLIC

See PUBLIC HEALTH

HIGHWAY AND ROAD LAW

Drafting the essential features of enabling turnpike legislation, 55.

HIGHWAY BRIDGES

See BRIDGES

HIGHWAY CURVES

See CURVES (alignement curves)

HIGHWAY ENGINEERS AND ENGINEERING

See ENGINEERS AND ENGINEERING; HIGHWAYS AND ROADS; *see also* under relative subject, e.g., EDUCATION; EMPLOYEES AND EMPLOYMENT

HIGHWAYS AND ROADS (General)

See also BRIDGE . . . ; COSTS, HIGHWAY AND ROAD; CURVES (alignement curves); MOTOR . . . (cross references thereunder); RIGHTS OF WAY (land strips); SOILS; TRAFFIC, HIGHWAY AND ROAD (cross reference thereunder); TUNNEL . . .

The highway problem following World War II and contributing factors enumerated, 340.

Suggested staff organization, with charts, for large turnpike projects during design, construction and operation phases, 60, 61, 64.

Financing

Turnpike financing methods, 54, 58.

Operation

"Planning and Operating Turnpikes," Charles M. Noble, 54.

Planning and Design

"Planning and Operating Turnpikes," Charles M. Noble, 54.

HIGHWAYS AND ROADS (Geographical)**California**

"Correction of Landslides and Slips-outs," Arthur W. Root, 281.

Maryland

Chesapeake Bay Bridge as important link in highway system of the United States, 245.

HISTORY, ENGINEERING

See under relative subject, e.g., JOINTS, BOLTED (cross reference thereunder); POWER PLANTS

HOISTING MACHINERY

See under specific types of machines, e.g., CRANES, DERRICKS AND POWER SHOVELS

HOSE

See under relative technical subject, e.g., WATER, FLOW OF . . .; see also NOZZLES (cross reference thereunder)

HUMUS

See COMPOST AND COMPOST-ING (cross references thereunder)

HURRICANES

See WIND . . .

HYDRAULIC JUMP

See also WATER, FLOW OF . . .

"Discharge Characteristics of Tainter Gates," Arthur Toch, 290.

"Open Channels with Nonuniform Discharge," Wen-Hsiung Li (with discussion), 255.

HYDRAULIC LABORATORIES

See also MODELS, HYDRAULIC

Test equipment and procedure for open channel constriction investigations, 999, 1000.

HYDRAULIC MACHINERY

See under type of machinery, e.g., PUMPS AND PUMPING

HYDRAULIC MODELS

See MODELS, HYDRAULIC

HYDRAULICS

See also AERATION; BREAK-WATERS (cross references thereunder); BULKHEADS; CANALS; CAVITATION; CHANNELS (waterways); CONDUITS; COSTS . . .; DAMS (cross references thereunder); DRAINAGE; EROSION . . .; FILTERS AND FILTRATION . . .; FLOODS (cross references thereunder); FLOW . . .

(cross references thereunder); FLUID (cross references thereunder); FLUMES; FOUNDATIONS . . .; FRICTION . . .; GAGES . . .; GROUND WATER; HARBORS; HYDRAULIC . . .; HYDRO- . . .; IRRIGATION . . .; LEVEES (cross reference thereunder); LIQUIDS . . .; LOCKS; METERS AND METERING; MODELS, HYDRAULIC; MULTI-PURPOSE PROJECTS; PENSTOCKS; PIPE . . .; POWER . . .; PUMPS AND PUMPING; RESERVOIRS . . .; RIVER . . .; RUNOFF; SEDIMENT AND SEDIMENTATION; SEEPAGE; SEWAGE . . .; SEWERS; SILT AND SILTING . . .; TANKS . . .; TERMINOLOGY; TIDES; TURBINES, WATER; TURBULENCE; VALLEYS; VALVES; VISCOSITY; WATER . . .; WAVES; WELLS

"Applications of the Relaxation Technique in Fluid Mechanics," John S. McNown, En-Yun Hsu and Chia-Shun Yih (with discussion), 650.

"Backwater Functions by Numerical Integration," Clint J. Keifer and Henry H. Chu (with discussion), 429.

"Flow in Rough Conduits," Henry M. Morris, Jr. (with discussion), 373.

"High-Velocity Tests in a Penstock," Maxwell F. Burke (with discussion), 863.

"Open Channels with Nonuniform Discharge," Wen-Hsiung Li (with discussion), 255.

HYDRAULIC TURBINES

See TURBINES, WATER

HYDRODYNAMICS

"Applications of the Relaxation Technique in Fluid Mechanics," John S. McNown, En-Yun Hsu and Chia-Shun Yih (with discussion), 650.

"Effect of Well Screens on Flow into Wells," Jack S. Petersen, Carl Rohwer and Maurice L. Albertson (with discussion), 563.

"Motion of Particles on Bed of a Turbulent Stream," Arthur T. Ippen and Ramjee P. Verma, 921.

HYDROELECTRIC PLANTS

See POWER PLANTS

HYDROELECTRIC POWER PLANTS

See POWER PLANTS

HYDROLOGY

See DRAINAGE; FLOOD . . . ; GROUND WATER; MARSHES; RAINFALL (cross references thereunder); RIVERS; RUNOFF; WATER . . .

HYDROMETRY

See WATER, FLOW OF . . .

HYDROSTATIC UPLIFT

See WATER PRESSURE

IMPACT

See also IMPULSE (cross reference thereunder); VIBRATION; WHEEL LOADS

"Welded Structures": A Symposium, Simon A. Greenberg, La Motte Grover, and C. L. Kreidler (with discussion), 103.

IMPULSE

See STRUCTURAL DYNAMICS; *see also* IMPACT

INDUSTRIAL PLANTS

See also COSTS, INDUSTRIAL PLANT; *see also* under specific type of plant, e.g., POWER PLANTS; also cross references under WORKS Difficulties of choosing best plant site, 417.

"Industrial Development in the South," Carl O. Hoyer (with discussion), 411.

INDUSTRIAL WASTE

See ODORS; REFUSE DISPOSAL; SEWAGE DISPOSAL; SEWAGE SLUDGE

INDUSTRIAL WATER SUPPLY

See IRRIGATION; WATER SUPPLY

INDUSTRY

See under relative technical classification; *see also* EMPLOYEES AND EMPLOYMENT; *also* under type of industry or industrial plant, e.g., STEEL PLANTS

INFILTRATION

See FLOODS (cross references thereunder); GROUND WATER; LAND . . . ; SEEPAGE

INLAND WATERWAYS

See WATERWAYS

INSPECTORS AND INSPECTION

See under relative subject, e.g., WELDS AND WELDING—Inspection

INSTRUMENTS

See GAGES; METERS AND METERING . . . ; *also* under general types of instruments, e.g., SURVEYING INSTRUMENTS; WIND MEASURING INSTRUMENTS; *also* cross reference under specific type of instrument, e.g., ANEMOMETERS; *also* cross references under APPARATUS; *also* under usage

IRRIGATION (General)

See also WATER SUPPLY

IRRIGATION (Geographical)**California**

"Statutory Control of Ground Water in the Western United States," S. T. Harding, 490.

Western States

"Statutory Control of Ground Water in the Western United States," S. T. Harding, 490.

IRRIGATION CANALS

"Design of Stable Channels," Emory W. Lane (with discussion), 1234.

JETS

See WATER, FLOW OF, THROUGH ORIFICES

JOINTS (General)

See also COSTS, JOINT; FAILURES, JOINT; RIVETS AND RIVETING; STRESS AND STRAIN—Joints; STRUCTURES, THEORY OF—Joints; WELDS AND WELDING

Advantage of pneumatic impact wrench in reducing physical effort required, and reducing noise, in bolt connector tightening, 1392.

Approved specifications for control of the assembly of high-tensile bolts, 1298.

"High-Strength Bolts in Structural Joints": A Symposium, W. C. Stewart; William H. Munse, D. T. Wright, and Nathan M. Newmark; Frank Baron and Edward W. Larson, Jr.; R. A. Hechtman, D. R. Young, A. G. Chin, and E. R. Savikko; Jack W. Carter, Kenneth H. Lenzen, and Lawrence T. Wyly; and T. R. Higgins and E. J. Ruble, 1295. *Discussion*: A. J. Francis; and William H. Munse, D. T. Wright, and Nathan M. Newmark; Glenn B. Woodruff; Karl de Vries; Harry C. Prince; and Jack W. Carter, Kenneth H. Lenzen, and Lawrence T. Wyly, 1299, 1353.

JOINT

Histo
bol
Relat
riv
join

JOINT

See J

JOINT

"Hig
Join
art
W.
Fri
son
Yo
vik
Le
T.
dis

JOINT

"We
Si
Gr
dis

JUM

See

KINE

See

LAB

See

LAB

e.
R
al
A
th
st
e.

LAB

See

LAB

e.
R
al

LAKE

See

LAKE

See

LAKE

See

JOINTS (General) (Continued)

History of the use of high strength bolts, 1296, 1389, 1391.

Relative fatigue strength of bolted, riveted butt-type joints, and lap joints, 1313, 1315.

JOINTS, BOLTED

See JOINTS (General)

JOINTS, RIVETED

"High-Strength Bolts in Structural Joints": A Symposium, W. C. Stewart; William H. Munse, D. T. Wright, and Nathan M. Newmark; Frank Baron and Edward W. Larson, Jr.; R. A. Hechman, D. R. Young, A. G. Chin, and E. R. Savikko; Jack W. Carter, Kenneth H. Lenzen, and Lawrence T. Wyly; and T. R. Higgins and E. J. Ruble (with discussion), 1295.

JOINTS, WELDED

"Welded Structures": A Symposium, Simon A. Greenberg, La Motte Grover, and C. L. Kreidler (with discussion), 103.

JUMP, HYDRAULIC

See HYDRAULIC JUMP

KINETIC ENERGY

See DYNAMICS . . . (cross references thereunder)

LABOR

See EMPLOYEES AND EMPLOYMENT

LABORATORIES

See under specific type of laboratory, e.g., HYDRAULIC LABORATORIES; *also* under relative subject; *also* under MODELS . . . ; TESTS AND TESTING (cross references thereunder); *also* under material, structure, or structural part tested, e.g., CLAY

LABORATORIES, HYDRAULIC

See HYDRAULIC LABORATORIES

LAKES

See WATER . . . ; WAVES

LAMINAR FLOW

See WATER, FLOW OF, IN PIPES

LAND . . .

See also EARTH . . . ; GROUND . . . ; MARSHES; SOIL . . . ; SURVEYS AND SURVEYING . . .

LAND SETTLEMENT

"Unusual Foundation Conditions in the Everglades," Paul H. Shea, 92.

LANDSLIDES

See also COSTS, LANDSLIDE

"Correction of Landslides and Slippouts," Arthur W. Root, 281.

LAND SURVEYS

See SURVEYS AND SURVEYING, PLANE

LATERAL FORCES

See EARTHQUAKES; WIND . . .

LAW

See LAW subject heading under related topic, e.g., GROUND WATER LAW; HIGHWAY AND ROAD LAW; *see also* CONTRACTS

LEAST SQUARES, THEORY OF

See PROBABILITY, THEORY OF

LEGISLATION

See under relative subject (under the subject law heading, e.g., HIGHWAY AND ROAD LAW)

LEVEES

See FOUNDATIONS, LEVEE

LIBRARIES**Searches**

See SURVEYS (research data) (cross references thereunder)

LIFT BRIDGES

See BRIDGES, MOBILE (LIFT)

LIFTING MACHINERY

See HOISTING MACHINERY (cross reference thereunder)

LIGHTING

See GAS . . .

LIMESTONE

Mississippian limestone formation at Hales Bar Dam and Hydroelectric Plant, in Tennessee, 541.

"Unusual Foundation Conditions in the Everglades," Paul H. Shea, 92.

LIMIT DESIGN, THEORY OF

Investigation and limit analysis of net area in tension as related to plastic strength, with testing apparatus, 1133, 1136, 1148, 1164.

LININGS

See under relative type, e.g., TUNNEL LININGS; *also* under relative subject

LIQUIDS, FLOW OF (General)

See also VALVES; VISCOSITY; WATER, FLOW OF . . .

LIQUIDS, FLOW OF (General)
(Continued)

"Applications of the Relaxation Technique in Fluid Mechanics," John S. McNown, En-Yun Hsu and Chia-Shun Yih (with discussion), 650.
Usage of the theory of finite differences, 651, 669.

LIQUIDS, FLOW OF, OVER WEIRS

"Applications of the Relaxation Technique in Fluid Mechanics," John S. McNown, En-Yun Hsu and Chia-Shun Yih (with discussion), 650.

LITIGATION

See under relative subject (under the subject law heading, e.g., GROUND WATER LAW)

LOAD

See BEARING CAPACITY; BUCKLING; EARTH PRESSURE; FAILURES; IMPACT; STRESS AND STRAIN; STRUCTURES; STRUCTURES, THEORY OF; VIBRATION; WATER PRESSURE; WHEEL LOADS; WIND PRESSURE (cross references thereunder); also under structure, structural member or part, e.g., BEAMS . . . ; JOINTS; SLABS

LOAD, BED

See CHANNELS; SILT AND SILTING . . . ; TURBULENCE; WATER, FLOW OF, IN OPEN CHANNELS

LOAD, SUSPENDED

See SEDIMENT AND SEDIMENTATION; SILT AND SILTING . . .

LOCKS

Improving locks at Hales Bar Dam, in Tennessee, 545.

LOSS OF ENERGY

See FRICTION; HYDRAULIC JUMP; VALVES; WATER, FLOW OF . . . ; WATER HAMMER

LOSS OF HEAD

See AERATION; FRICTION; WATER, FLOW OF . . .

MACHINERY

See under specific type of machine, e.g., CRANES, DERRICKS AND POWER SHOVELS; TURBINES; also under usage

MAPPING INSTRUMENTS

See SURVEYING INSTRUMENTS

MAPS AND MAPPING (General)

See also SURVEYS AND SURVEYING; also under relative subject

MAPS AND MAPPING, AERIAL

"The Importance of Shoran Surveying," Carl I. Aslakson, 225.

MARINE ENGINEERS AND ENGINEERING

See under relative subject, e.g., SHIP-BUILDING

MARSHES

"Unusual Foundation Conditions in the Everglades," Paul H. Shea, 92.

MASONRY

See EARTHQUAKES

MATERIALS OF CONSTRUCTION

See also AGGREGATES AND AGGREGATION; ALUMINUM; CLAY; CONCRETE; COSTS . . . ; EARTHQUAKES; EROSION . . . ; GRAVEL; LIMESTONE; METALS (cross references thereunder); PEAT; PERMEABILITY OF MATERIALS (cross references thereunder); SAND; SEEPAGE; SOILS; STEEL; STRENGTH OF MATERIALS (cross references thereunder); STRESS AND STRAIN . . . ; STRUCTURES, THEORY OF . . . ; also under usage

"Plastic Strength of Structural Members": A Symposium, Robert L. Ketter, Edmund L. Kaminsky, and Lynn S. Beedle; Paul P. Bijlaard, Gordon P. Fisher, and George Winter; John W. Clark; and W. Gordon Brady and Daniel C. Drucker (with discussion), 1019.

MATERIALS, PERMEABILITY OF

See PERMEABILITY OF MATERIALS (cross references thereunder)

MATERIALS, STRENGTH OF

See STRENGTH OF MATERIALS (cross references thereunder)

MATERIALS, TESTING OF

See TESTS AND TESTING (cross references thereunder)

MATERIALS, WASTE

See cross references under WASTE DISPOSAL

MATHEMATICS

See also EQUATIONS; GRAPHICAL CHARTS (cross references thereunder); PROBABILITY, THEORY OF; also under relative subject

MATHEMATICS

"Applications of the Relaxation Technique in Fluid Mechanics," John S. McNown, En-Yun Hsu and Chia-Shun Yih (with discussion), 650.

Successive differences

Use of solvents, nels,

MEASUREMENTS

See GROSS

TEE, STF, ING

MECHANICS

See also

CREAM, (CREAM, DRA, ST, (CREAM, ST, TU, AN, the

MECHANICAL

See also

CREAM, (CREAM, DRA, ST, (CREAM, ST, TU, AN, the

MECHANICAL

See V

MECHANICAL

See S

MEMO

See CIV, (CIV, of, of, also

MEMO

See C

MEMO

See G, era, OB, e.g., tur

MEMO

See (S)

MERCURY

See

MATHEMATICS (Continued)

"Applications of the Relaxation Technique in Fluid Mechanics," John S. McNown, En-Yun Hsu and Chia-Shun Yih (with discussion), 650.
Successful usage of theory of finite differences, 651.
Use of theory of finite differences to solve design problems of stable channels, 1242, 1260.

MEASURING INSTRUMENTS

See GAGES; METERS AND METERING; SURVEYING INSTRUMENTS; WIND MEASURING INSTRUMENTS

MECHANICAL ENGINEERS AND ENGINEERING

See under relative subject, e.g., MACHINERY (cross references thereunder); MOTOR . . . (cross references thereunder); TURBINES . . .

MECHANICS

See also DYNAMICS . . . (cross references thereunder); FLUID (cross references thereunder); HYDRAULICS; MATHEMATICS; STRENGTH OF MATERIALS (cross references thereunder); STRUCTURAL . . .; STRUCTURES, THEORY OF; TESTS AND TESTING (cross references thereunder)

MECHANICS, FLUID

See WATER, FLOW OF

MECHANICS, SOIL

See SOILS

MEMBERS (ASCE)

See AMERICAN SOCIETY OF CIVIL ENGINEERS. (For memoirs of deceased members, *see* name of member in Author Index. *See also* p. 1557)

MEMBERS, COMPRESSION

See COLUMNS

MEMBERS, STRUCTURAL

See BEAMS . . .; COLUMNS; GIRDERS; STRUCTURES (General); STRUCTURES, THEORY OF; also under name of material, e.g., CONCRETE; also under structure, e.g., BRIDGES

MEMOIRS OF DECEASED MEMBERS

See name of member in Author Index. (*See also* p. 1557)

MERCHANT MARINE

See WATER TRANSPORTATION

METALS

See ALLOYS (cross references thereunder); MATERIALS OF CONSTRUCTION; REINFORCED CONCRETE (cross reference thereunder); STRENGTH OF MATERIALS (cross references thereunder); STRESS AND STRAIN; WELDS AND WELDING; also under specific metal or its alloy, e.g., ALUMINUM; STEEL

METEOROLOGY

See ATMOSPHERIC . . .; WIND METERS AND METERING (General)

See also GAGES . . .; INSTRUMENTS (cross references thereunder); WEIRS (cross references thereunder)

METERS AND METERING, CURRENT

Gas-operated pitot tube installation, 877, 878, 889, 890, 891, 894.

"High-Velocity Tests in a Penstock," Maxwell F. Burke (with discussion), 863.

A pitot tube for small pipes, 892.

METERS AND METERING, VENTURI

"High-Velocity Tests in a Penstock," Maxwell F. Burke (with discussion), 863.

METERS AND METERING, WATER (stream velocity)

See METERS AND METERING, CURRENT

MILITARY ENGINEERS AND ENGINEERING

See NATIONAL DEFENSE; also under relative technical subject, e.g., AIRPORTS; BRIDGES; FILTERS AND FILTRATION; SEWAGE; WATER SUPPLY

MINERALS

See under relative technical subject, e.g., CONCRETE; MATERIALS OF CONSTRUCTION; ROCK (cross references thereunder)

MODELS (General)

"Photoelastic Analogy for Nonhomogeneous Foundations," Allen J. Curtis and F. E. Richart, Jr., 35.

MODELS, AERODYNAMIC

Value of aerodynamic model testing for suspension bridge problem investigations, 748.

MODELS, HYDRAULIC

"Discharge Characteristics of Tainter Gates," Arthur Toch, 290.

"Hydraulic Model Studies of Martin Dam Draft Tubes," Carl E. Kindsvater and Richard R. Randolph, Jr. (with discussion), 1399.

"Total Sediment Load Measured in Turbulence Flume," Paul C. Benedict, Maurice L. Albertson and Donald Q. Matejka (with discussion), 457.

MODELS, STRUCTURAL

"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, E. F. Kelley, Raymond Archibald, A. A. Jakkuula, Raymond Archibald, C. B. McCullough, G. S. Paxson, F. H. Franklin, C. F. Goodrich, Jonathan Jones, C. Earl Webb, Russell G. Cone, Shortridge Hardesty, Charles M. Spofford, O. L. Grover, E. F. Kelley, R. B. McMinn, Leon S. Moisseiff, C. H. Purcell, Norman C. Raab, George D. Whittle, Theodor von Karman, Frank M. Masters, P. L. Pratley, John G. Little, Leon H. Nishkian, R. W. Crum, Franklin N. Wray, Charles S. Sunderland, H. L. Dryden, G. B. Schubauer, O. H. Ammann, Elmer K. Timby, Emil H. Praeger, F. B. Farquharson, Charles E. Andrew, Glenn B. Woodruff, and Hardy Cross, 721.

"Analysis and Tests of a Cylindrical Shell Roof Model," Bruno Thurlmann and Bruce G. Johnston (with discussion), 615.

MOISTURE

See CONCRETE—Effect of Natural Processes; REFUSE DISPOSAL; SOILS

MOMENTS

See also STRESS AND STRAIN; STRUCTURES, THEORY OF; also under specific type of stress, e.g., BUCKLING; TORSION

"Analysis and Tests of a Cylindrical Shell Roof Model," Bruno Thurlmann and Bruce G. Johnston (with discussion), 615.

"Inelastic Behavior of Reinforced Concrete Members," Lawrence H. N. Lee (with discussion), 181.

"Plastic Strength of Structural Members": A Symposium, Robert L. Ketter, Edmund L. Kaminsky, and Lynn S. Beedle; Paul P. Bijlaard, Gordon P. Fisher, and George Win-

ter; John W. Clark; and W. Gordon Brady and Daniel C. Drucker (with discussion), 1019.

MOMENTUM

See WATER, FLOW OF . . .

MOTOR TRUCKS

See WHEEL LOADS

MOTOR VEHICLES

See TUNNELS, VEHICULAR; WHEEL LOADS

MOTORWAYS

See HIGHWAYS AND ROADS

MOVABLE BRIDGES

See BRIDGES, MOVABLE

MOVABLE WATER GATES

See WATER GATES, MOVABLE

MULTI-PURPOSE PROJECTS (RIVER PROJECTS)

"Modernization of the Hales Bar Plant," Adolf A. Meyer (with discussion), 539.

MUNICIPAL AUTHORITIES

"Financing of Sewage Works in Pennsylvania," Samuel I. Zack, 843.

MUNICIPAL ENGINEERS AND ENGINEERING

See ENGINEERS AND ENGINEERING; *see also* AIRPORTS; BRIDGES; CITIES; CITY PLANNING; COSTS . . .; DRAINAGE; FILTERS AND FILTRATION . . .; FIRE (cross reference thereunder); GAS . . .; HARBORS; POWER . . .; PUBLIC HEALTH; REFUSE DISPOSAL; SANITATION; SEWAGE . . .; SEWERS; TRAFFIC . . .; WATER . . .; and similar relative subjects

MUNICIPALITIES

See CITIES

NATIONAL DEFENSE

See also cross references under WAR AND ENGINEERING

Value of inland waterways in national defense, 1522, 1527.

NAVAL ARCHITECTURE

See SHIPBUILDING

NAVIGATION

See CANALS; CHANNELS; DAMS (cross references thereunder); FLOODS (cross references thereunder); HARBORS; LOCKS; MULTI-PURPOSE PROJECTS; RIVERS; TIDES; WATER TRANSPORTATION; WATERWAYS

NEIG

See C

NETW

See N

NOME

See T

NOMC

Nomc

448

NONU

See V

NOZZ

See T

NUIS

See ref

PU

OBIT

See (S)

OCEA

See O

ODO

Odo

89

OIL

See O

OIL,

See O

OIL

See O

OIL

See O

OPE

See O

ORD

See O

ORG

See O

ORG

See O

NEIGHBORHOOD PLANNING*See CITY PLANNING***NETWORKS***See MATHEMATICS***NOMENCLATURE***See TERMINOLOGY***NOMOGRAPHS**

Nomograph for backwater curves, 447, 448.

NONUNIFORM FLOW*See WATER, FLOW OF . . .***NOZZLES***See WATER, FLOW OF, THROUGH ORIFICES***NUISANCES, ABATEMENT OF**

See INDUSTRIAL WASTE (cross references thereunder); *ODORS*; *PUBLIC HEALTH*

OBITUARIES OF MEMBERS

See name of member in Author Index. (See also p. 1557)

OCEAN . . .*See WAVES***OCEAN BARS***See BARS (alluvia)***OCEAN BEACHES***See SAND DUNES***OCEAN CURRENTS***See WAVES***OCEAN WAVES***See WAVES***ODORS**

Odor as related to refuse composting, 897, 910, 911.

OIL ENGINES*See ENGINES***OIL, FLOW OF***See WELLS***OIL WELLS***See WELLS***OPEN CHANNELS**

See CHANNELS; WATER, FLOW OF, IN OPEN CHANNELS

ORDNANCE

See METALS (cross references thereunder)

ORGANIZATIONS

See SOCIETIES, TECHNICAL; see also AMERICAN SOCIETY OF CIVIL ENGINEERS

ORIFICES*See WATER, FLOW OF, THROUGH ORIFICES***OSCILLATION***See VIBRATION; WAVES***PARKING, AIRPLANE***See AIRPLANE PARKING***PAVEMENT AND PAVING (General)***See SOILS; WHEEL LOADS***PEAT**

Results of shear test and other physical characteristics of peat in the Everglades, 98, 99.

"Unusual Foundation Conditions in the Everglades," Paul H. Shea, 92.

PEDOLOGY*See SOILS—Classification***PENSTOCKS**

"High-Velocity Tests in a Penstock," Maxwell F. Burke, 863. *Discussion:* Steponas Kolupaila, Frank B. Campbell, Arthur L. Collins, R. Clifford Youngquist, and Maxwell F. Burke, 884.

PERCOLATION*See GROUND WATER; SEEPAGE***PERMEABILITY OF MATERIALS**

See SEEPAGE; STRENGTH OF MATERIALS; also under type of material, e.g., CONCRETE; SOILS

PERSONNEL

See EMPLOYEES AND EMPLOYMENT

PETROLEUM*See OIL* (cross references thereunder)**PHILOSOPHY, ENGINEERING**

See ENGINEERS AND ENGINEERING—Philosophy

PHOTOELASTICITY

"Photoelastic Analogy for Nonhomogeneous Foundations," Allen J. Curtis and F. E. Richart, Jr., 35.

Photoelastic investigations of stress concentrations, 1353.

PHOTOGRAMMETRY

See SURVEYS AND SURVEYING, AERIAL

PIERS, BRIDGE*See BRIDGE PIERS***PILES AND PILE DRIVING***See also BEARING CAPACITY*

Usage of piles to combat landslides, 286.

PILLARS*See COLUMNS***PIPE LINES***See also PENSTOCKS; PUMPS AND PUMPING; WATER, FLOW OF, IN PIPES; WATER HAMMER**"Pressure Surges in Pump Installations," John Parmakian (with discussion), 697.***PIPES AND PIPING** (fluid conveyance)*See CONDUITS; PENSTOCKS; PIPE LINES; SEWERS; SILT AND SILTING; WATER, FLOW OF, IN PIPES; WATER HAMMER***PITOT TUBES***See METERS AND METERING, CURRENT***PITTING***See CAVITATION***PLANE SURVEYS AND SURVEYING***See SURVEYS AND SURVEYING, PLANE***PLANNING***See AIRPORTS; CITY PLANNING; HIGHWAYS AND ROADS—Planning and Design; NEIGHBORHOOD PLANNING (cross reference thereunder); POSTWAR PLANNING (cross references thereunder)***PLANTS** (industrial buildings and equipment)*See INDUSTRIAL PLANTS; see also under type of plant, e.g., POWER PLANTS; STEEL PLANTS; also WORKS (cross references thereunder)***PLASTIC FLOW***See CONCRETE—Plastic Flow***PLASTICITY***See also CONCRETE—Plastic Flow; ELASTICITY**"Impulsive Motion of Elasto-Plastic Beams," Hans H. Bleich and Mario G. Salvadori (with discussion), 499.**Plastic analysis in structural design, 122, 128, 131.**"Plastic Strength of Structural Members": A Symposium, Robert L. Ketter, Edmund L. Kaminsky and Lynn S. Beedle; Paul P. Bijlaard, Gordon P. Fisher and George Winter; John W. Clark; and W. Gordon**Brady and Daniel C. Drucker, 1019. Discussion: George Winter; and Robert L. Ketter, Edmund L. Kaminsky, and Lynn S. Beedle; Robert L. Ketter and Lynn S. Beedle; J. F. Baker and Michael R. Horne; and Paul P. Bijlaard, Gordon P. Fisher, and George Winter; William H. Munse; Paul P. Bijlaard; and W. Gordon Brady and Daniel C. Drucker, 1028, 1070, 1133.***PLASTIC THEORY***See PLASTICITY***PLATES***See also FAILURES, PLATE; JOINTS . . . ; SLABS; STRESS AND STRAIN—Plates**"Dead-Load Stress Measurement in a Long Span Bridge," Lawrence T. Wyly, Maurice B. Lagaard, Ralph W. Kluge, Kenneth H. Lenzen, Edward W. Larson, Jr., and Lewis B. McCommon, Jr. (with discussion), 311.***POLLUTION, AIR***See AIR SANITATION (cross reference thereunder)***POPULATION***Ratio and rate of increase of population in the South, 1950, 413.***PORE WATER PRESSURE***See WATER PRESSURE***POROSITY***See SEEPAGE***PORTS***See AIRPORTS; HARBORS***POSTWAR PLANNING***See ENGINEERS AND ENGINEERING—Philosophy; also under relative subject***POWER (General)***See DAMS (cross references thereunder); DYNAMICS (cross references thereunder); ENGINES; FAILURES, POWER; FUEL (cross references thereunder); PUMPS AND PUMPING; TURBINES, WATER; WATER HAMMER; WATER POWER (cross references thereunder)***POWERHOUSES***See POWER PLANTS***POWER PLANTS (General)***See also PENSTOCKS; TURBINES, WATER***POWER***"Movement of a Power Plant," V. J. Viggiani, 1183.***POWER***Alabama**"Hydroelectric Power Plants," W. L. Daniels, 1960.***MARYLA***Conover**119***TENNES***Histor**and hyd**ydro**mod**Pla**ya***PLA***Plan**Pla**ya***PRES***(A**ne**See**CI**se***PRES***See**CA**SU**PR**ST**W**W**er***PRES***See**un**th***PRO***Pro**a**tu**Usa**pa*

er, 1019.
er; and
L. Ka-
le; Rob-
Beedie;
Horne;
ordon P.
William
ard; and
aniel C.

POWER PLANTS (General) (Cont.)

"Movements in Structural Concrete in a Powerhouse," Stanley Moyer and Viggo Hansen (with discussion), 1183.

POWER PLANTS (Geographical)

Alabama

"Hydraulic Model Studies of Martin Dam Draft Tubes," Carl E. Kindsvater and Richard R. Randolph, Jr. (with discussion), 1399.

Maryland

Conowingo Powerhouse cross section, 1199.

Tennessee River Valley

History and plan of Hales Bar Dam and Hydroelectric Plant, a pioneer hydroelectric plant in the United States, 539, 540.

"Modernization of the Hales Bar Plant," Adolf A. Meyer, 539. *Dis-*
cussion: George R. Rich, Clarence E. Blee, George A. Jessop, and Adolf A. Meyer, 557.

Plans of Hales Bar Hydroelectric Plant powerhouse and transformer yard, in Tennessee, 547, 549, 551, 552.

PRESIDENTIAL ADDRESSES (American Society of Civil Engineers)

See AMERICAN SOCIETY OF CIVIL ENGINEERS—Addresses; *see also* under subject of address

PRESSURE

See ATMOSPHERIC PRESSURE; CAVITATION; EARTH PRESSURE; IMPACT; PUMPS AND PUMPING; STRESS AND STRAIN; WATER HAMMER; WATER PRESSURE; WAVES; WIND PRESSURE (cross references thereunder)

PRESSURE GAGES

See GAGES, PRESSURE

PRIME MOVERS

See ENERGY (cross references thereunder); POWER (cross references thereunder)

PROBABILITY, THEORY OF

Probability theory of large numbers applied to aseismic design of structures, 782.

Usage of least squares method for computing straight line curves in friction tests, 872.

Bibliography

Bibliography on engineering seismology, 801.

PROFESSIONAL STANDARDS

See ENGINEERS AND ENGINEERING—Professional Relationships

PROPERTY (landed property)

See LAND . . . ; RIGHTS OF WAY (land strips)

PROTOTYPES AND MODELS

See MODELS

PUBLIC HEALTH

See also SANITATION; WATER SUPPLY

Pneumatic impact wrench as related to noise reduction in bolted construction work, 1395.

PUBLIC HEALTH ENGINEERS AND ENGINEERING

See ENGINEERS AND ENGINEERING; PUBLIC HEALTH

PUBLIC SERVICES

See under type of service, e.g., SEWAGE DISPOSAL

PUBLIC UTILITIES

See GAS . . . ; POWER (cross references thereunder); POWER PLANTS; RAILROAD . . . ; RATE MAKING . . .

PUBLIC WORKS

Financing

See under type of structure or project, e.g., WATERWAYS—Financing

PUMPING ENGINES

See ENGINES

PUMPING STATIONS

See DRAINAGE

PUMPS AND PUMPING (General)

See also COSTS, PUMP AND PUMPING; FAILURES, PUMP AND PUMPING

Characteristics of an axial-flow pump, 25.

General arrangement of Tracy Pumping Plant, in California, 699.

"Selection and Design of High-Volume, Low-Head Pumps," George F. Snodgrass, 17.

PURIFICATION

See AIR SANITATION (cross reference thereunder)

RADIAL GATES

See WATER GATES, MOVABLE

RAILROAD BRIDGES*See* BRIDGES**RAILROAD CURVES***See* CURVES (alignment curves)**RAILROADS (General)***See also* BRIDGES; CURVES (alignment curves); TRAFFIC, RAILROAD**Design and Construction.** *See* under relative subject, e.g., BRIDGES; RAILROAD TRACKS**RAILROAD TRACKS***See also* COSTS, RAILROAD TRACK; CURVES (alignment curves); EMBANKMENTS

Simplified standardized method of transit lining of high-speed tracks with specified advantages and disadvantages, 521, 537.

RAILROAD TRAFFIC*See* TRAFFIC, RAILROAD**RAINFALL (General)***See* DRAINAGE; FLOODS (cross references thereunder); SEEPAGE; *see also* RUNOFF**RATE MAKING**

"Some Economic Aspects of Waterway Projects," Haywood R. Faison (with discussion), 1480.

RATE MAKING LAW

Inland water traffic rate fixing case appealed to United States Supreme Court, and 82nd Congress pending legislation, as a result of an Interstate Commerce Commission decision, 1515, 1520.

RECORDING APPARATUS*See* under general type of apparatus; *see also* under relative subject**RECORDING INSTRUMENTS***See* under relative subject**RECORD KEEPING***See* NOMOGRAPHS; *also* under relative subject, e.g., VIBRATION; WIND**RECREATIONAL FACILITIES***See* CITY PLANNING**REDUNDANCE, STRUCTURAL***See* STRUCTURES, THEORY OF**REFUSE DISPOSAL***See also* COSTS, REFUSE DISPOSAL; ODORS; SEWAGE DISPOSAL; SEWAGE SLUDGE

Moisture in relation to successful composting, 903, 909, 910.

"Stabilization of Municipal Refuse by Composting," Percy H. McGahey and Harold B. Gotaas, 897. *Discussion:* Arthur W. Furbank; and Percy H. McGahey and Harold B. Gotaas, 916.**Bibliography**

Bibliography of composting, 914.

REGIONAL PLANNING*See* HIGHWAYS AND ROADS—Planning and Design**REINFORCED CONCRETE***See* CONCRETE . . .**RELAXATION (numerical analysis)***See* under relative subject, e.g., LIQUIDS, FLOW OF**REPORTS OF COMMITTEES***See* AMERICAN SOCIETY OF CIVIL ENGINEERS—Committee Reports; *see also* under subject of report**RESEARCH***See also* AMERICAN SOCIETY OF CIVIL ENGINEERS; HYDRAULIC LABORATORIES; MODELS; PROBABILITY, THEORY OF; STRUCTURES, THEORY OF; TESTS AND TESTING (cross references thereunder); *also* under relative subject, e.g., ROOFS AND ROOFING; WELDS AND WELDING

Future studies of United States Bureau of Reclamation for improving canal design procedures, 1258, 1261.

Research needed in aerodynamic stability of suspension bridges, 766.

Research needed in relationship between compressive strength and void ratio, 1451, 1452, 1479.

RESERVOIRS (General)*See also* DAMS (cross references thereunder)**RESERVOIRS, FLOOD CONTROL**

"High-Velocity Tests in a Penstock," Maxwell F. Burke (with discussion), 863.

RESONANCE*See* VIBRATION; WATER HAMMER; WAVES**RETAINING WALLS***See also* BULKHEADS; EARTH PRESSURE; EMBANKMENTS

Usage of retaining walls to combat landslides, 286.

REVENTMENT*See WAVES***RIGHTS OF WAY** (land strips)

Acquiring turnpike rights of way, 60.

RIGID FRAMES*See STRESS AND STRAIN—Frames, Rigid***RIVER BANKS AND BANK PROTECTION***See FLOODS* (cross references thereunder); SEDIMENT AND SEDIMENTATION; SILT AND SILTING, CHANNEL**RIVER BASINS***See DRAINAGE; VALLEYS***RIVER CHANNELS***See CHANNELS***RIVER RECTIFICATION***See RIVER REGULATION* (cross references thereunder)**RIVER REGULATION***See BARS* (alluvia); IRRIGATION CANALS; RIVERS; WATER, FLOW OF, IN OPEN CHANNELS**RIVERS (General)***See also BARS* (alluvia); BRIDGE . . . ; CHANNELS; COSTS . . . ; DRAINAGE; EROSION, STREAM; GAGES, STREAM; HYDRAULIC LABORATORIES; LOCKS; MODELS, HYDRAULIC; MULTI-PURPOSE PROJECTS (RIVER PROJECTS); RUNOFF; SEDIMENT AND SEDIMENTATION; SILT AND SILTING, CHANNEL; TIDES; TRAFFIC, RIVER; TRAFFIC, WATERWAY; TUNNELS, VEHICULAR; VALLEYS; WATER, FLOW OF, IN OPEN CHANNELS; WATER TRANSPORTATION; WATERWAY . . . ; WAVES

Estuary characteristics complicating total sediment measuring problems, 688.

"Sediment Sampling in Tidal Waterways," Edward A. Schultz, 687.

Financing*Some Economic Aspects of Waterway Projects*, Haywood R. Faison (with discussion), 1480.**RIVERS (Geographical)****Mississippi River***"Some Economic Aspects of Waterway Projects," Haywood R. Faison (with discussion), 1480.***Passaic River***"Erection of Main River Span, Passaic River Bridge," Jonathan Jones, 208.***RIVER TIDES***See TIDES***RIVER TRAFFIC***See TRAFFIC, RIVER***RIVER TRANSPORTATION***See WATER TRANSPORTATION***RIVER VALLEYS***See VALLEYS***RIVETED JOINTS***See JOINTS, RIVETED***RIVETS AND RIVETING***See also CONNECTORS AND CONNECTIONS* (cross references thereunder); STRESS AND STRAIN—Rivets and Riveting*"High-Strength Bolts in Structural Joints": A Symposium, W. C. Stewart; William H. Munse, D. T. Wright, and Nathan M. Newmark; Frank Baron and Edward W. Larson, Jr.; R. A. Hechtmann, D. R. Young, A. G. Chin, and E. R. Savikko; Jack W. Carter, Kenneth H. Lenzen, and Lawrence T. Wyly; and T. R. Higgins and E. J. Ruble (with discussion), 1295.***ROADBEDS***See DRAINAGE; RAILROAD TRACKS; TUNNELS . . .***ROADS***See HIGHWAYS AND ROADS***ROCK***See FOUNDATIONS; LIMESTONE***ROOFS AND ROOFING***See also STRUCTURES, THEORY OF—Roofs and Roofing**"Analysis and Tests of a Cylindrical Shell Roof Model," Bruno Thurlmann and Bruce G. Johnston (with discussion), 615.*

Ancient and first modern shell roof in the United States, 615, 616.

Bibliography

Problems relative to cylindrical shell roofs, 642.

SEDIMENT AND SEDIMENTATION (Continued)

"Sediment Sampling in Tidal Waterways," Edward A. Schultz, 687.

"Total Sediment Load Measured in Turbulence Flume," Paul C. Benedict, Maurice L. Albertson and Donald Q. Matejka, 457. *Discussion:* W. H. Corbett, O. C. Hansen, and W. M. Borland; and Paul C. Benedict, Maurice L. Albertson and Donald Q. Matejka, 485.

Usage of baffles and battens to force sediment dunes into suspension, 457, 462, 463.

SEDIMENTATION TANKS (sewage)

See TANKS, SEDIMENTATION (sewage)

SEEPAGE

See also GROUND WATER

"Applications of the Relaxation Technique in Fluid Mechanics," John S. McNown, En-Yun Hsu and Chia-Shun Yih (with discussion), 650.

"Movements in Structural Concrete in a Powerhouse," Stanley Moyer and Viggo Hansen (with discussion), 1183.

"Unusual Foundation Conditions in the Everglades," Paul H. Shea, 92.

SEISMOLOGY

See also EARTHQUAKES

Bibliography

Aseismic design problems, 801.

SETTLEMENT, LAND

See LAND SETTLEMENT

SETTLEMENT OF STRUCTURES

See BEARING CAPACITY; EMBANKMENTS; FOUNDATIONS . . . ; SOILS . . .

SETTLING BASINS (water supply)

"Flocculation and Flocculation Basins," Thomas R. Camp, 1.

SETTLING TANKS (sewage)

See TANKS, SEDIMENTATION (sewage)

SEWAGE COLLECTION

See SEWERS

SEWAGE DISPOSAL (General)

See also COSTS; SEWAGE DISPOSAL; FILTERS AND FILTRATION; SEWAGE; SEWAGE SLUDGE; SEWERS; TANKS . . .

"Flocculation and Flocculation Basins," Thomas R. Camp, 1.

Financing

"Financing of Sewage Works in Pennsylvania," Samuel I. Zack, 843.

SEWAGE DISPOSAL (Geographical)**Chicago, Ill.**

"Sewage Aeration Practice in Chicago," Norval E. Anderson, 351.

Pennsylvania

"Financing of Sewage Works in Pennsylvania," Samuel I. Zack, 843.

Industrial waste regulations under sewer rental system in certain Pennsylvania communities, 853, 859.

SEWAGE DISPOSAL LAW

"Financing of Sewage Works in Pennsylvania," Samuel I. Zack, 843.

SEWAGE FILTERS AND FILTRATION

See FILTERS AND FILTRATION, SEWAGE

SEWAGE SLUDGE

See also SEWAGE DISPOSAL; TANKS . . .

"Sewage Aeration Practice in Chicago," Norval E. Anderson, 351.

"Summary operation information and tabulated data for major activated sludge plants, Chicago, Illinois Sanitary District, processing pioneers, 352, 353, 357, 362.

SEWAGE TANKS

See cross references under TANKS, SEWAGE

SEWAGE TREATMENT

See SEWAGE DISPOSAL

SEWAGE WORKS

See FILTRATION PLANTS, SEWAGE; SEWAGE DISPOSAL

SEWERAGE

See SEWERS

SEWERS (General)

See also BACKWATER; RAINFALL (cross references thereunder); RUNOFF; WATER, FLOW OF, IN PIPES

SEWERS (Geographical)**Pennsylvania**

Municipal sewer rental charge system as existing in certain Pennsylvania communities, 843, 846.

SHEAR

"Analysis and Tests of a Cylindrical Shell Roof Model," Bruno Thurlin-

ROUGHNESS*See* **FRICITION****ROUGHNESS FACTOR***See* **FRICITION COEFFICIENTS****RUBBISH DISPOSAL***See* **REFUSE DISPOSAL****RUNOFF (General)***See also* **RAINFALL** (cross references thereunder)**RUNOFF (Geographical)****California***"High-Velocity Tests in a Penstock,"*
Maxwell F. Burke (with discussion),
863.**RUNWAYS***See* **AIRPORTS****SAFETY***See* **EARTHQUAKES****SAFETY FACTOR***See* under relative subject**SAMPLING***See* under relative subject, e.g., **SEDIMENT AND SEDIMENTATION**;
also under relative material, e.g.,
SOILS**SAND***See also* **BARS (alluvia)**; **COSTS**,
SAND . . . ; **GRAVEL**; **SEDIMENT AND SEDIMENTATION**;
SEEPAGE; **SILT AND SILTING** . . . ; **SOILS***"Design of Stable Channels,"* Emory
W. Lane (with discussion), 1234.
Interbedded sand and rock foundations,
101.*"Motion of Particles on Bed of a Tur-
bulent Stream,"* Arthur T. Ippen and
Ramjee P. Verma, 921.*"Sand Compaction by Vibroflotation,"*
Elio D'Appolonia, Callix E. Miller,
Jr., and Thomas M. Ware, 154.**SAND BARS***See* **BARS (alluvia)****SAND DUNES***"Total Sediment Load Measured in
Turbulence Flume,"* Paul C. Bene-
dict, Maurice L. Albertson and Don-
ald Q. Matejka (with discussion),
457.**SANITARY ENGINEERS AND EN-
GINEERING***See* **ENGINEERS AND ENGI-
NEERING**; **SANITATION****SANITATION***See also* **COSTS** . . . ; **DRAINAGE**;
**ENGINEERS AND ENGINEER-
ING**; **FILTERS AND FILTRA-
TION** . . . ; **ODORS**; **PIPES AND
PIPING** (cross references there-
under); **REFUSE DISPOSAL**;
SEWAGE DISPOSAL; **SEWAGE
SLUDGE**; **SEWERS**; **TANKS**
. . . ; **WATER** . . .*"Flocculation and Flocculation Basins,"*
Thomas R. Camp, 1.**SCHOOLS AND COLLEGES, EN-
GINEERING***See* **EDUCATION****SCIENTIFIC SOCIETIES***See* **AMERICAN SOCIETY OF
CIVIL ENGINEERS**; **SOCIE-
TIES, TECHNICAL**; *see also* **EN-
GINEERS AND ENGINEERING****SCOUR***See* **EROSION** . . .**SCREENS, WELL***See* **WELLS****SEA . . .***See* **MARINE** . . . (cross reference
thereunder); **OCEAN** . . . (cross
references thereunder)**SEACOAST***See* **HARBORS**; **TIDES**; **WAVES****SEAPORTS***See* **HARBORS****SEARCHES, LIBRARY***See* **LIBRARIES**—**Searches** (cross ref-
erence thereunder)**SEASHORE***See* **SHORES AND SHORE PRO-
TECTION** (cross references there-
under)**SEA WALLS***See* **WATER PRESSURE**; **WAVES****SEAWAYS***See* **WATERWAYS****SEDIMENT AND SEDIMENTA-
TION***See also* **SILT AND SILTING**;
TURBULENCE*"Design of Stable Channels,"* Emory
W. Lane (with discussion), 1234.*"Evaluation of the Performance of Bio-
filtration Plants,"* Renville S. Rankin
(with discussion), 823.*"Flocculation and Flocculation Basins,"*
Thomas R. Camp, 1.**SEDIMEN-****T****"Sedi-****wa-****"Tot-****"Tu-****"dic-****"ald-****"W-****"W-****"dic-****"ald-****"Usag-****"see-****"462-****"SEDI-****"age-****"See****"(so-****"SEEP-****"See****"Mo-****"a-****"Vi-****"11-****"Un-****"Ev-****"SEIS-****"See****"Bibli-****"Asei-****"SETT-****"See****"SETT-****"See****"SETT-****"See****"SETT-****"See****"SETT-****"See****"SETT-****"See****"SETT-****"See****"SETT-****"See****"SETT-****"See****"SETT-****"See**

SHEAR (Continued)

mann and Bruce G. Johnston (with discussion), 615.

"Design of Stable Channels," Emory W. Lane (with discussion), 1234.

"Flocculation and Flocculation Basins," Thomas R. Camp, I.

"High-Strength Bolts in Structural Joints": A Symposium, W. C. Stewart; William M. Munse, D. T. Wright, and Nathan M. Newmark; Frank Baron and Edward W. Larson, Jr.; R. A. Hechtman, D. R. Young, A. G. Chin, and E. R. Savikko; Jack W. Carter, Kenneth H. Lenzen, and Lawrence T. Wyly; and T. R. Higgins and E. J. Ruble (with discussion), 1295.

Investigation and limit analysis of net area in tension, 1133, 1153.

"Strength Characteristics of Compacted Clays," Gerald A. Leonards (with discussion), 1420.

SHEARING STRESS

See SHEAR

SHELL STRUCTURES

See FLUMES; PIPE LINES; PIPES AND PIPING (cross references thereunder); ROOFS AND ROOFING; STRESS AND STRAIN—Shell Structures; STRUCTURES, THEORY OF—Shell Structures

SHIPBUILDING

Ship fracture problems, 113.

SHIP CANALS

See CANALS

SHIPS AND SHIPPING

See WATER TRANSPORTATION (and cross references thereunder)

SHORAN

See under usage, e.g., TRIANGULATION

SHORES AND SHORE PROTECTION (lands adjacent to lake, ocean or sea water)

See SAND DUNES; WAVES; *also* cross references under RIVER BANKS AND BANK PROTECTION

SHRINKAGE, CONCRETE

See CONCRETE—Shrinkage (cross reference thereunder)

SIDEWALKS (General)

See CONCRETE

SIEVES

See SCREENS, WELL (cross reference thereunder)

SILT AND SILTING (General)

See also AGGREGATES AND AGGREGATION; SEDIMENT AND SEDIMENTATION

"Total Sediment Load Measured in Turbulence Flume," Paul C. Benedict, Maurice L. Albertson and Donald Q. Maejka (with discussion), 457.

"Motion of Particles on Bed of a Turbulent Stream," Arthur T. Ippen and Ramjee P. Verma, 921.

SKIN FRICTION

See FRICTION

SLABS

See also PLATES

"Stress Measurements, San Leandro Creek Bridge," Ray W. Clough and Charles F. Scheffey, 939.

SLIDES

See LANDSLIDES

SLIPS AND SLIPPAGE (movement of surfaces)

See JOINTS, BOLTED (cross reference thereunder); JOINTS, RIVETED; LANDSLIDES

SLOPING CHANNELS

See CHANNELS

SLUDGE, SEWAGE

See SEWAGE SLUDGE

SOCIETIES, TECHNICAL

See also AMERICAN SOCIETY OF CIVIL ENGINEERS; ENGINEERS AND ENGINEERING; *also* under relative subject, e.g., WATERWAYS

Organization and activities of American Society for Engineering Education, Engineers' Council for Professional Development and Society for the Promotion of Engineering Education, 342, 343.

SOIL . . .

See also EARTH . . . ; GROUND . . . ; LAND . . .

SOIL MECHANICS

See SOILS

SOIL PRESSURE

See EARTH PRESSURE

SOILS (General)

See also BEARING CAPACITY; CLAY; DRAINAGE; EARTH

SOILS (General) (Continued)

PRESSURE; EROSION ; FOUNDATIONS ; FRICTION; GRAVEL; GROUND . . . ; LAND . . . ; PEAT; SAND; SEDIMENT AND SEDIMENTATION; SEEPAGE; SILT AND SILTING ; STRESS AND STRAIN—Soils; *also* under name of soil structure, e.g., LEVEES (cross reference thereunder)

Compost as a soil conditioner, 897.

Coulomb Law on soil resistance and its historical usage, 1422, 1450, 1467, 1475.

"Effect of Well Screens on Flow into Wells," Jack S. Petersen, Carl Rother and Maurice L. Albertson (with discussion), 563.

Bibliography

Bibliography on the strength characteristics of soils, 1452.

Classification

Fort Union formation, North Dakota clay, Mississippi River bank, and Fort Belvoir, Virginia soil characteristics, 1425, 1435, 1464, 1469.

Compaction. See BEARING CAPACITY**Construction**

"Design of Stable Channels," Emory W. Lane (with discussion), 1234.

Tests and Testing

Mechanical analysis tests of Bartow, Florida soils, 154.

"Photoelastic Analogy for Nonhomogeneous Foundations," Allen J. Curtis and F. E. Richart, Jr., 35.

"Reduction in Soil Strength with Increase in Density," Charles R. Foster (with discussion), 803.

"Strength Characteristics of Compacted Clays," Gerald A. Leonards (with discussion), 1420.

Three bay triaxial compression testing apparatus with schematic piping diagram, with data, 1432, 1434, 1436, 1455, 1471.

"The Undisturbed Consolidation Behavior of Clay," John H. Schmertmann, 1201. *Discussion:* Robert L. Crisp, and John H. Schmertmann, 1228.

SOIL TRANSPORTATION

See SEDIMENT AND SEDIMENTATION; SILT AND SILTING

SOLIDS, FLOW OF

See EARTH FLOW (cross reference thereunder); PUMPS AND PUMPING; SEDIMENT AND SEDIMENTATION; SILT AND SILTING . . . ; WATER, FLOW OF, IN OPEN CHANNELS; WATER, FLOW OF, IN PIPES

SPACE STRUCTURES

See STRUCTURES, THEORY OF . . . ; *also* under specific type of structure

SPACE TRUSSES

See STRUCTURES, THEORY OF—Trusses and Trussed Structures; TRUSSES

SPECIFICATIONS

See also under relative subject, e.g., JOINTS (General); WELDS AND WELDING; *see also* CONTRACTS

"Plastic Strength of Structural Members": A Symposium, Robert L. Ketter and Edmund L. Kaminsky, and Lynn S. Beedle; Paul P. Bijlaard, Gordon P. Fisher, and George Winter; John W. Clark; and W. Gordon Brady and Daniel C. Drucker (with discussion), 1019.

SPEED

See RAILROADS . . .

SPIRALS

See CURVES (alignement curves)

SPICE PLATES

See PLATES

STABILITY

See AERODYNAMICS; BUCKLING; HYDRODYNAMICS; SOIL . . .

STANDARDS, PROFESSIONAL

See ENGINEERS AND ENGINEERING—Professional Relationships

STATICALLY INDETERMINATE STRUCTURES

See STRUCTURES, THEORY OF STATIONS

See under relative type of station, e.g., PUMPING STATIONS (cross reference thereunder); *see also* cross references under TERMINALS

STATISTICS

See relative subject

STEEL (General)

See also COSTS; STEEL; MATERIALS OF CONSTRUCTION; STRESS AND STRAIN—Steel; WELDS AND WELDING; *also* under special structure or structural part

“Welded Structures”: A Symposium, Simon A. Greenberg, La Motte Grover, and C. L. Kreidler (with discussion), 103.

STEEL PLANTS

Organization and operation of a steel company, 148.

STIFFENING TRUSSES

See TRUSSES, STIFFENING

STIFFNESS

“Aerodynamic Stability of Suspension Bridges”: 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, E. F. Kelley, Raymond Archibald, A. A. Jakkuula, Raymond Archibald, C. B. McCullough, G. S. Paxson, F. H. Franklin, C. B. Goodrich, Jonathan Jones, C. Earl Webb, Russell G. Cone, Shortridge Hardesty, Charles M. Spofford, O. L. Grover, E. F. Kelley, R. B. McMinn, Leon S. Moisseiff, C. H. Purcell, Norman C. Raab, George D. Whittle, Theodor von Karman, Frank M. Masters, P. L. Pratley, John G. Little, Leon H. Nishkian, R. W. Crum, Franklin N. Wray, Charles C. Sunderland, H. L. Dryden, G. B. Schubauer, O. H. Ammann, Elmer K. Timby, Emil H. Praeger, F. B. Farquharson, Charles E. Andrew, Glenn B. Woodruff, and Hardy Cross, 721.

“Plastic Strength of Structural Members”: A Symposium, Robert L. Ketter, Edmund L. Kaminsky, and Lynn S. Beedle; Paul P. Bijlaard, Gordon P. Fisher, and George Winter; John W. Clark; and W. Gordon Brady and Daniel C. Drucker (with discussion), 1019.

STONE

See GRAVEL; LIMESTONE; ROCK (cross references thereunder)

STORMS

See RAINFALL (cross references thereunder); WIND . . .

STORM WATER

See DRAINAGE; SEWAGE DISPOSAL; SEWERS

STRAIN

See STRESS AND STRAIN

STRAIN GAGES

See GAGES, STRAIN

STRAINMETERS

See GAGES, STRAIN

STREAM EROSION

See EROSION, STREAM

STREAM FLOW

See WATER, FLOW OF, IN OPEN CHANNELS

STREAM GAGES

See GAGES, STREAM

STREAMS

See RIVERS and cross references thereunder

STREAMS, FIRE

See FIRE STREAMS (cross reference thereunder)

STREETS

See BRIDGES; CITIES; CITY PLANNING; CONDUITS; CURVES (alignment curves); *see also* HIGHWAYS AND ROADS

STRENGTH OF MATERIALS

See FAILURES . . . ; STRESS AND STRAIN; *also* under specific material (*see* list of materials under MATERIALS OF CONSTRUCTION); *also* under fabricated structure or structural part, e.g., STRUCTURES

STRESS AND STRAIN (General)

See also CONCRETE—Temperature; EARTH PRESSURE; EARTHQUAKES; ELASTICITY; FAILURES . . . ; GAGES, STRAIN; IMPACT; MOMENTS; PHOTOELASTICITY; STIFFNESS; STRENGTH OF MATERIALS (cross references thereunder); STRUCTURES, THEORY OF; TEMPERATURE; VIBRATION; WATER PRESSURE; WAVES; WHEEL LOADS; WIND . . .; *also* under specific type of stress, e.g., BUCKLING; SHEAR; TORSION

Usage of whitewash as a valuable strain indicating device, 1097, 1106, 1107.

Alloys

Aluminum alloy testing to failure for plastic strength, 1135.

Beams (General). *See also* BUCKLING; SHEAR; STRESS AND STRAIN—Flanges; TORSION

“Deflections of a Circular Beam Out of Its Initial Plane,” Enrico Volterra (with discussion), 65.

STRE
C
Beams
Test
ce
130
Beams
“Pla
ber
Ke
Ly
Go
ter
Br
dis
Break
SU
Bridge
Bridge
“Str
C
Cl
Bridge
“Ae
Ba
so
Su
Ra
Ra
la
C
Si
Sp
Ra
C
G
K
P
N
W
D
A
P
E
H
Dan
70
Bridge
“De
L
W
M
A
W
W
M
w
Clay.

STRESS AND STRAIN (General)*(Continued)***Beams (General) (Continued)**

Test arrangement and impact test procedure for welded beams, 116, 117, 130.

Beams, Continuous

"Plastic Strength of Structural Members": A Symposium, Robert L. Ketter, Edmund L. Kaminsky, and Lynn S. Beedle; Paul P. Bijlaard, Gordon P. Fisher, and George Winter; John W. Clark; and W. Gordon Brady and Daniel C. Drucker (with discussion), 1019.

Breakwaters. *See* WATER PRESSURE**Bridges (General). *See also* SHEAR****Bridges, Girder**

"Stress Measurements, San Leandro Creek Bridge," Ray W. Clough and Charles F. Scheffey, 939.

Bridges, Suspension

"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, E. F. Kelley, Raymond Archibald, A. A. Jakkula, Raymond Archibald, C. B. McCullough, G. S. Paxson, F. H. Franklin, C. F. Goodrich, Jonathan Jones, C. Earl Webb, Russell G. Cone, Shortridge Hardesty, Charles M. Spofford, O. L. Grover, E. F. Kelley, R. B. McMinn, Leon S. Moisseiff, C. H. Purcell, Norman C. Raab, George D. Whittle, Theodor von Karman, Frank M. Masters, P. L. Pratley, John G. Little, Leon H. Nishkian, R. W. Crum, Franklin N. Wray, Charles C. Sunderland, H. L. Dryden, G. B. Schubauer, O. H. Ammann, Elmer K. Timby, Emil H. Praeger, F. B. Farquharson, Charles E. Andrew, Glenn B. Woodruff, and Hardy Cross, 721.

Damping characteristics, 745, 759, 765, 766, 771.

Bridges, Truss

"Dead-Load Stress Measurement in a Long Span Bridge," Lawrence T. Wily, Maurice B. Lagaard, Ralph W. Kluge, Kenneth H. Lenzen, Edward W. Larson, Jr., and Lewis B. McCammon, Jr., 311. *Discussion:* Almon H. Fuller; and Lawrence T. Wily, Maurice B. Lagaard, Ralph W. Kluge, Kenneth H. Lenzen, Edward W. Larson, Jr., and Lewis B. McCammon, Jr., 336.

Clay. *See* SHEAR

Columns

"Plastic Strength of Structural Members": A Symposium, Robert L. Ketter, Edmund L. Kaminsky, and Lynn S. Beedle; Paul P. Bijlaard, Gordon P. Fisher, and George Winter; John W. Clark; W. Gordon Brady and Daniel C. Drucker (with discussion), 1019.

Concrete

"Inelastic Behavior of Reinforced Concrete Members," Lawrence H. N. Lee (with discussion), 181.

Curved Structures. *See* STRUCTURES, THEORY OF—Curved Structures

Flanges

"Plastic Strength of Structural Members": A Symposium, Robert L. Ketter, Edmund L. Kaminsky, and Lynn S. Beedle; Paul P. Bijlaard, Gordon P. Fisher, and George Winter; John W. Clark; and W. Gordon Brady and Daniel C. Drucker (with discussion), 1019.

Usage of drawn rectangular aluminum alloy tubes for testing plastic strength in flanges, 1117.

Foundations

"Constrained Circular Beams on Elastic Foundations," Enrico Volterra and Randall Chung, 301.

"Photoelastic Analogy for Nonhomogeneous Foundations," Allen J. Curtis and F. E. Richart, Jr., 35.

Frames, Rigid

"Plastic Strength of Structural Members": A Symposium, Robert L. Ketter, Edmund L. Kaminsky, and Lynn S. Beedle; Paul P. Bijlaard, Gordon P. Fisher, and George Winter; John W. Clark; and W. Gordon Brady and Daniel C. Drucker (with discussion), 1019.

"Welded Structures": A Symposium, Simon A. Greenberg, La Motte Grover, and C. L. Kreidler (with discussion), 103.

Joints

Action of joints as to variance in load and slip relationship, 1295.

Correlation between stresses determined photoelastically and by strain gages, 1362.

Fatigue testing apparatus, 1307.

"High-Strength Bolts in Structural Joints": A Symposium, W. C. Stewart; William H. Munse, D. T. Wright, and Nathan M. Newmark;

STRESS AND STRAIN (General)
(Continued)

Joints (Continued)

Frank Baron and Edward W. Larson, Jr.; R. A. Hechman, D. R. Young, A. G. Chin, and E. R. Savikko; Jack W. Carter, Kenneth H. Lenzen, and Lawrence T. Wyly; and T. R. Higgins and E. J. Ruble (with discussion), 1295.

"Plastic Strength of Structural Members": A Symposium, Robert L. Ketter, Edmund L. Kaminsky, and Lynn S. Beedle; Paul P. Bijlaard, Gordon P. Fisher, and George Winter; John W. Clark; and W. Gordon Brady and Daniel C. Drucker (with discussion), 1019.

Plates

"Plastic Strength of Structural Members": A Symposium, Robert L. Ketter, Edmund L. Kaminsky, and Lynn S. Beedle; Paul P. Bijlaard, Gordon P. Fisher, and George Winter; John W. Clark; and W. Gordon Brady and Daniel C. Drucker (with discussion), 1019.

Reinforced Concrete. See Concrete (hereunder)

Rivets and Riveting

"High-Strength Bolts in Structural Joints": A Symposium, W. C. Stewart; William H. Munse, D. T. Wright, and Nathan M. Newmark; Frank Baron and Edward W. Larson, Jr.; R. A. Hechman, D. R. Young, A. G. Chin, and E. R. Savikko; Jack W. Carter, Kenneth H. Lenzen, and Lawrence T. Wyly; and T. R. Higgins and E. J. Ruble (with discussion), 1295.

Hot-driven and cold-driven rivet behavior and fatigue characteristics under stress, 1322.

Shell Structures

"Analysis and Tests of a Cylindrical Shell Roof Model," Bruno Thurlmann and Bruce G. Johnston, 615. *Discussion:* G. C. Ernst; Charles S. Whitney; Boyd G. Anderson; and Bruno Thurlmann and Bruce G. Johnston, 644.

Soils

"Reduction in Soil Strength with Increase in Density," Charles R. Foster (with discussion), 803.

"Strength Characteristics of Compacted Clays," Gerald A. Leonards (with discussion), 1420.

"The Undisturbed Consolidation Behavior of Clay," John H. Schmertmann (with discussion), 1201.

Steel. See also Plates (hereunder)

Laboratory tests of bolted joints, 1295.

"Plastic Strength of Structural Members": A Symposium, Robert L. Ketter, Edmund L. Kaminsky, and Lynn S. Beedle; Paul P. Bijlaard, Gordon P. Fisher, and George Winter; John W. Clark; and W. Gordon Brady and Daniel C. Drucker (with discussion), 1019.

"Welded Structures": A Symposium, Simon A. Greenberg, La Motte Grover, and C. L. Kreidler (with discussion), 103.

Structures (General)

"Plastic Strength of Structural Members": A Symposium, Robert L. Ketter, Edmund L. Kaminsky, and Lynn S. Beedle; Paul P. Bijlaard, Gordon P. Fisher, and George Winter; John W. Clark; and W. Gordon Brady and Daniel C. Drucker (with discussion), 1019.

STRESS SHEARING

See SHEAR

STRINGERS

See BEAMS

STRUCTURAL ANALYSIS

See EQUATIONS; STRESS AND STRAIN; STRUCTURES, THEORY OF . . .

STRUCTURAL DYNAMICS

See also AERODYNAMICS; EARTHQUAKES; STRUCTURES, THEORY OF; VIBRATION

"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, E. F. Kelley, Raymond Archibald, A. A. Jakkula, Raymond Archibald, C. B. McCullough, G. S. Paxson, F. H. Franklin, C. F. Goodrich, Jonathan Jones, C. Earl Webb, Russell G. Cone, Shortridge Hardesty, Charles M. Spofford, O. L. Grover, E. F. Kelley, R. B. McMiun, Leon S. Moisseiff, C. H. Purcell, Norman C. Raab, George D. Whittle, Theodor von Karman, Frank M. Masters, P. L. Pratley, John G. Little, Leon H. Nishkian, R. W. Crum, Franklin N. Wray, Charles C. Sunderland, H. L. Dryden, G. B. Schubauer, O. H. Ammann, Elmer K. Timby, Emil H.

STRU

Pr

E.

H.

"Imp

Bo

G.

STRU

EE

See

STRU

See

T

STRU

See

(

STRU

See

STRUCTURAL DYNAMICS (Cont.)

Praeger, F. B. Farquharson, Charles E. Andrew, Glenn B. Woodruff, and Hardy Cross, 721.

"Impulsive Motion of Elasto-Plastic Beams," Hans H. Bleich and Mario G. Salvadori (with discussion), 499.

STRUCTURAL ENGINEERS AND ENGINEERING

See STRUCTURES . . . ; *see also* under relative structure, e.g., BRIDGES . . . ; BUILDINGS

STRUCTURAL JOINTS

See JOINTS

STRUCTURAL MATERIALS

See MATERIALS OF CONSTRUCTION

STRUCTURAL MEMBERS

See MEMBERS, STRUCTURAL (cross references thereunder)

STRUCTURAL MODELS

See MODELS, STRUCTURAL

STRUCTURAL REDUNDANCE

See STRUCTURES, THEORY OF

STRUCTURAL STEEL

See STEEL

STRUCTURES (General)

See also BUILDINGS; CONSTRUCTION; FOUNDATIONS . . . ; MATERIALS OF CONSTRUCTION; MODELS, STRUCTURAL; STRESS AND STRAIN . . . ; STRUCTURES, THEORY OF . . . ; VIBRATION; *also* under specific type of structure or related subject; *also* under general types of structures, e.g., SHELL STRUCTURES (cross references thereunder)

"Plastic Strength of Structural Members": A Symposium, Robert L. Ketter and Edmund L. Kaminsky, and Lynn S. Beedle; Paul P. Bijlaard, and Gordon P. Fisher, and George Winter; John W. Clark; and W. Gordon Brady and Daniel C. Drucker (with discussion), 1019.

STRUCTURES, CONTINUOUS

See STRUCTURES, THEORY OF

STRUCTURES, CURVED

See CURVED STRUCTURES (cross reference thereunder)

STRUCTURES, SETTLEMENT OF

See BEARING CAPACITY; EMBANKMENTS; FOUNDATIONS . . . ; SOILS . . .

STRUCTURES, SHELL

See SHELL STRUCTURES (cross references thereunder)

STRUCTURES, SPACE

See SPACE STRUCTURES (cross references thereunder)

STRUCTURES, STATICALLY INDETERMINATE

See STATICALLY INDETERMINATE STRUCTURES (cross reference thereunder)

STRUCTURES, THEORY OF (General)

See also STRESS AND STRAIN; *also* under type of structure or structural part

"Plastic Strength of Structural Members": A Symposium, Robert L. Ketter, Edmund L. Kaminsky, and Lynn S. Beedle; Paul P. Bijlaard, Gordon P. Fisher and George Winter; John W. Clark; and W. Gordon Brady and Daniel C. Drucker (with discussion), 1019.

Bibliography

Bibliography on engineering seismology, 801.

Beams and Girders (General)

"Impulsive Motion of Elasto-Plastic Beams," Hans H. Bleich and Mario G. Salvadori, 499. *Discussion:* P. S. Symonds; and Hans H. Bleich and Mario G. Salvadori, 516.

Bridges

"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, E. F. Kelley, Raymond Archibald, A. A. Jakkula, Raymond Archibald, C. B. McCullough, G. S. Paxson, F. H. Franklin, C. F. Goodrich, Jonathan Jones, C. Earl Webb, Russell G. Cone, Shortridge Hardesty, Charles M. Spofford, O. L. Grover, E. F. Kelley, R. B. McMinn, Leon S. Moisseiff, C. H. Purcell, Norman C. Raab, George D. Whittle, Theodor von Karman, Frank M. Masters, P. L. Pratley, John G. Little, Leon H. Nishkian, R. W. Crum, Franklin N. Wray, Charles C. Sunderland, H. L. Dryden, G. B. Schubauer, O. H. Ammann, Elmer K. Timby, Emil H. Praeger, F. B. Farquharson, Charles E. Andrew, Glenn B. Woodruff, and Hardy Cross, 721.

STRUCTURES, THEORY OF (General) (Continued)**Columns**

"Plastic Strength of Structural Members": A Symposium, Robert L. Ketter, Edmund L. Kaminsky, and Lynn S. Beedle; Paul P. Bijlaard, Gordon P. Fisher, and George Winter; John W. Clark; and W. Gordon Brady and Daniel C. Drucker (with discussion), 1019.

Concrete, Reinforced

"Inelastic Behavior of Reinforced Concrete Members," Lawrence H. N. Lee (with discussion), 181.

Curved Structures

"Constrained Circular Beams on Elastic Foundations," Enrico Volterra and Randall Chung, 301.

Earthquake Problems

"Aseismic Design of Firmly Founded Elastic Structures," Lawrence E. Goodman, Emilio Rosenblueth and Nathan M. Newmark, 782.

Frames (General). *See also* Beams and Girders (hereunder); Columns (hereunder)**Frames, Continuous**

"Lateral Buckling of I-Beams," Mario G. Salvadori (with discussion), 1165.

Girders (General). *See* Beams and Girders (General) (hereunder)**Joints**

Working hypothesis explaining rationally cause and remedy for fatigue failures in structural joints, 1353, 1380.

Roofs and Roofing

"Analysis and Tests of a Cylindrical Shell Roof Model," Bruno Thurlmann and Bruce G. Johnston (with discussion), 615.

Shell Structures

"Analysis and Tests of a Cylindrical Shell Roof Model," Bruno Thurlmann and Bruce G. Johnston (with discussion), 615.

Trusses and Trussed Structures

"Plastic Strength of Structural Members": A Symposium, Robert L. Ketter, Edmund L. Kaminsky, and Lynn S. Beedle; Paul P. Bijlaard, Gordon P. Fisher, and George Winter; John W. Clark; and W. Gordon Brady and Daniel C. Drucker (with discussion), 1019.

STRUCTURES, TRUSSED

See STRUCTURES, THEORY OF —Trusses and Trussed Structures; TRUSSES . . .

STRUCTURES, UNDERGROUND

See UNDERGROUND STRUCTURES (cross references thereunder)

STRUTS

See COLUMNS

SUB- . . .

See also UNDER- . . .

SUBSTRUCTURES

See CONCRETE; FOUNDATIONS (and cross references thereunder); MASONRY (cross reference thereunder); also under type of substructure, e.g., TUNNELS

SURFACE PROFILES

See WATER SURFACE PROFILES (cross reference thereunder)

SURFACE RUNOFF

See RUNOFF

SURFACES, SLIPPAGE OF

See SLIPS AND SLIPPAGE (movement of surfaces) (cross references thereunder)

SURGES (water surface)

See WATER HAMMER; WAVES

SURVEYING

See SURVEYS AND SURVEYING SURVEYING INSTRUMENTS

"The Importance of Shoran Surveying," Carl I. Aslakson, 225.

Bibliography

Shoran as a surveying instrument, 233.

SURVEYS (research data)

See under relative subject, e.g., CONCRETE; *see also* RESEARCH

SURVEYS AND SURVEYING (General)

See also MAPS AND MAPPING . . .; PROPERTY (landed property) (cross references thereunder); TRIANGULATION

SURVEYS AND SURVEYING, AERIAL

See also MAPS AND MAPPING, AERIAL

"The Importance of Shoran Surveying," Carl I. Aslakson, 225.

Bibliography

Shoran in aerial surveying, 233.

SURVEYS AND SURVEYING, GEODETIC

"The Importance of Shoran Surveying," Carl I. Aslakson, 225.

SURVEYS AND SURVEYING, PLANE

"Transit Lining of High-Speed Track," Neil R. Berndt (with discussion), 521.

SUSPENDED LOAD

See SEDIMENT AND SEDIMENTATION; SILT AND SILTING

...

SUSPENSION BRIDGES

See BRIDGES, SUSPENSION

SWAMPS

See MARSHES

SYMBOLS

See under relative subject, e.g., HYDRAULICS; MATHEMATICS

Tainter Gates

See WATER GATES, MOVABLE

TANGENTS, CURVE

See RAILROAD TRACKS

TANKS (General)

See WATER, FLOW OF, IN OPEN CHANNELS

TANKS, AERATION

"Flocculation and Flocculation Basins," Thomas R. Camp, 1.

"Sewage Aeration Practice in Chicago," Norval E. Anderson, 351.

TANKS, SEDIMENTATION (sewage)

See also SETTLING BASINS (water supply)

"Flocculation and Flocculation Basins," Thomas R. Camp, 1.

"Sewage Aeration Practice in Chicago," Norval E. Anderson, 351.

TANKS, SETTLING (sewage)

See TANKS, SEDIMENTATION (sewage)

TANKS, SEWAGE

See COSTS, TANK (SEWAGE TANKS); TANKS, AERATION; TANKS, SEDIMENTATION (sewage)

TAXIWAYS

See AIRPORTS

TECHNICAL SCHOOLS

See EDUCATION

TECHNICAL SOCIETIES

See SOCIETIES, TECHNICAL; *see also* AMERICAN SOCIETY OF CIVIL ENGINEERS; ENGINEERS AND ENGINEERING

TEMPERATURE

See also CONCRETE—Temperature "Analysis and Tests of a Cylindrical Shell Roof Model," Bruno Thurlmann and Bruce G. Johnston (with discussion), 615.

"Dead-Load Stress Measurement in a Long Span Bridge," Lawrence T. Wyly, Maurice B. Lagaard, Ralph W. Kluge, Kenneth H. Lenzen, Edward W. Larson, Jr., and Lewis B. McCommon, Jr. (with discussion), 311.

"Stress Measurements, San Leandro Creek Bridge," Ray W. Clough and Charles F. Scheffey, 939.

Temperature in relation to composting, 905, 910.

TENSILE STRESS

See STRESS AND STRAIN

TENSION

See STRESS AND STRAIN

TERMINALS (structures and localities)

See AIR TERMINALS (cross reference thereunder)

TERMINOLOGY (Arranged hereunder by specific or comprehensive subject word when possible)

Beams. (Balk as a military term for stringer beams of aluminum alloys), 141.

City planning. (Neighborhood and urban sprawl as city planning terms), 450, 451.

Clay compaction. (Relative soil resistance terms), 1450.

Columns. (Secant formula as a stress term), 1124.

Consolidation test terms defined, 1203, 1204, 1209.

Hurricane terms, 179.

Landslide and slipout differentiated, 281.

Plastic flow. (Usage of terms, contained plastic flow, limit load, and impending plastic flow), 1137, 1153.

Refuse disposal. (Aerobic and anaerobic composting processes compared), 899.

Sediment as a term, 1235.

TERMINOLOGY (Continued)

Sewage disposal. (Biofiltration as a term), 823.

Sewage disposal. (Sludge age, solids aeration period, and solids rate as sewage disposal terms used by designer and operator), 355.

Stable and unstable channel defined, 1235, 1276.

Steel. (Scratching, laying out, and fitting as used in steel plants), 151.

Submergence, as vertical distance in pumping operations, 23.

Theory of limit design. (Statically admissible stress field, and kinematically admissible velocity field), 1137, 1138.

Water flow. (Wake interference flow and skimming flow defined), 377.

Wind. (High velocity wind terms), 179.

TESTING MACHINES

See under use, material, structure or structural part tested

TESTS AND TESTING

See BUCKLING; ELASTICITY; FAILURES . . . ; LABORATORIES (cross references thereunder); MODELS . . . ; SHEAR; STRENGTH OF MATERIALS (cross references thereunder); STRESS AND STRAIN; STRUCTURES, THEORY OF; TORSION; WATER, FLOW OF . . . ; also under material, structure or structural part tested, e.g., ROOFS AND ROOFING; SOILS—Tests and Testing

THEORIES

See cross references hereunder and under ANALYSIS OF DATA; *see also* under relative subject or its relative science, e.g., HYDRAULICS; MATHEMATICS

THEORY OF BOUNDARY LAYER (fluid flow)

See BOUNDARY LAYER, THEORY OF (cross references thereunder)

THEORY OF ELASTICITY

See ELASTICITY

THEORY OF FINITE DIFFERENCES

See MATHEMATICS

THEORY OF FLUTTER

See BRIDGES, SUSPENSION

THEORY OF LEAST SQUARES

See PROBABILITY, THEORY OF

THEORY OF LIMIT DESIGN

See LIMIT DESIGN, THEORY OF

THEORY OF PLASTICITY

See PLASTICITY

THEORY OF PROBABILITY

See PROBABILITY, THEORY OF

THEORY OF STRUCTURES

See STRUCTURES, THEORY OF

THEORY, PLASTIC

See PLASTICITY

THERMAL DEFORMATION

See TEMPERATURE

THROW, WATER

See JETS (cross reference thereunder)

THRUST

See under relative structure, structural part or material, e.g., BEAMS . . . ; ROOFS AND ROOFING

TIDES

See also WAVES

"Sediment Sampling in Tidal Waterways," Edward A. Schultz, 687.

TOLLS (General)

Establishing the toll system on turnpikes, 62.

TOOLS

See under usage

TORSION

"Lateral Buckling of I-Beams," Mario G. Salvadori (with discussion), 1165.

"Plastic Strength of Structural Members": A Symposium, Robert L. Ketter, Edmund L. Kaminsky, and Lynn S. Beedle; Paul P. Bijlaard, Gordon P. Fisher, and George Winter; John W. Clark; and W. Gordon Brady and Daniel C. Drucker (with discussion), 1019.

TOWBOATS AND TOWING

See BARGES

TRACKS

See under type of track, e.g., RAILROAD TRACKS

TRADE WASTE

See INDUSTRIAL WASTE (cross references thereunder)

TRAFFIC (General)

See also FREIGHT; TRANSPORTATION (cross references thereunder); WHEEL LOADS

TRAFFI

Actua
and
nat
197

"Tra
Wa

TRAFF
See '

TRAFF
Water
ma
Sta

TRAFF
Inlau
sy

TRAFF
See
R

TRAFF
See
(

"So
Pr
di
Tran
w
1

TRAFF
See
See

TRAFFIC, AIRPORT

Actual and estimated traffic (passenger and cargo) at Puerto Rico International Airport, at San Juan, 1940-1970, 366.

"Traffic at an International Airport," Walther Prokosch, 364.

TRAFFIC, HIGHWAY AND ROAD

See TOLLS

TRAFFIC, RAILROAD

Waterway competition, including rate making practices, in the United States, 1480, 1504, 1506, 1540.

TRAFFIC, RIVER

Inland traffic on the Mississippi River system, 1927-1950, 1496.

TRAFFIC, VEHICULAR

See TRAFFIC, HIGHWAY AND ROAD (cross reference thereunder)

TRAFFIC, WATERWAY

See also specific type of waterway (hereunder)

"Some Economic Aspects of Waterway Projects," Haywood R. Faison (with discussion), 1480.

Traffic growth statistics for six inland waterways in the United States, 1936-1950, 1484.

TRAIN . . .

See RAILROAD . . .

TRAJECTORY, WATER

See JETS (cross reference thereunder)

TRANSPORTATION

See CANALS; FREIGHT; RIVERS; SOIL TRANSPORTATION (cross references thereunder); TRAFFIC; WATER TRANSPORTATION; WATERWAYS

TRAVELING CRANES

See CRANES, DERRICKS AND POWER SHOVELS

TRIANGULATION

See also SURVEYS AND SURVEYING

"The Importance of Shoran Surveying," Carl I. Aslakson, 225.

TRIAXIAL COMPRESSION APPARATUS

See SOILS—Tests and Testing

TRUCKS

See MOTOR TRUCKS (cross reference thereunder)

TRUSS BRIDGES

See BRIDGES, TRUSS (cross references thereunder)

TRUSSED STRUCTURES

See STRUCTURES, THEORY OF
—Trusses and Trussed Structures; TRUSSES . . .

TRUSSES (General)

See also BRIDGES, TRUSS (cross references thereunder); STRUCTURES, THEORY OF—Trusses and Trussed Structures

TRUSSES, STIFFENING

"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, E. F. Kelley, Raymond Archibald, A. A. Jakkula, Raymond Archibald, C. B. McCullough, G. S. Paxson, F. H. Franklin, C. F. Goodrich, Jonathan Jones, C. Earl Webb, Russell G. Cone, Shortridge Hardesty, Charles M. Spofford, O. L. Grover, E. F. Kelley, R. B. McMinn, Leon S. Moisseiff, C. H. Purcell, Norman C. Raab, George D. Whittle, Theodor von Karman, Frank M. Masters, P. L. Pratley, John G. Little, Leon H. Nishkian, R. W. Crum, Franklin N. Wray, Charles C. Sunderland, H. L. Dryden, G. B. Schubauer, O. H. Ammann, Elmer K. Timby, Emil H. Praeger, F. B. Farquharson, Charles E. Andrew, Glenn B. Woodruff, and Hardy Cross, 721.

TUBES

See CONDUITS; DRAFT TUBES; NOZZLES (cross reference thereunder); PIPE LINES; PIPES AND PIPING (cross references thereunder); PITOT TUBES (cross reference thereunder); SHELL STRUCTURES (cross references thereunder); TUNNELS; WATER, FLOW OF, IN PIPES

TUNNEL LININGS

"Construction of the Elizabeth River Tunnel," Joseph Peraino, 423.

TUNNELS (General)

See also COSTS, TUNNEL

TUNNELS, VEHICULAR

"Construction of the Elizabeth River Tunnel," Joseph Peraino, 423.

TURBINES, WATER

See also PENSTOCKS

"Hydraulic Model Studies of Martin Dam Draft Tubes," Carl E. Kindsvater and Richard R. Randolph, Jr. (with discussion), 1399.

TURBINES, WATER (Continued)

Turbine design as developed for Hales Bar Hydroelectric Plant, in Tennessee, see, 559, 562.

TURBULENCE (water agitation)

See also FRICTION . . . ; HYDRAULIC JUMP; WATER, FLOW OF . . .

"Flow in Rough Conduits," Henry M. Morris, Jr. (with discussion), 373.

"Motion of Particles on Bed of a Turbulent Stream," Arthur T. Ippen and Ramjee P. Verma, 921.

Procedures for forcing bed load into suspension by increased turbulence, 461.

"Total Sediment Load Measured in Turbulence Flume," Paul C. Benedict, Maurice L. Albertson and Donald Q. Matejka (with discussion), 457.

TURBULENCE, WIND

See WIND . . .

TURNPIKES

See HIGHWAYS AND ROADS; TOLLS

TWISTING

See TORSION; *also* under relative material, structure or structural part, e.g., BEAMS

UNDER- . . .

See also SUB- . . .

UNDERFLOW

See SEEPAGE; WELLS

UNDERGROUND STRUCTURES

See under type of structure, e.g., CONDUITS; SEWERS; *see also* under related subject, e.g., SOILS

UNDERGROUND WATER

See GROUND WATER

UNDERWATER CONSTRUCTION

See under type of construction, e.g., TUNNELS

UNITED STATES WEATHER BUREAU

See under relative subject, e.g., FLOODS (cross references thereunder); WIND . . .

UNIT STRESSES

See STRESS AND STRAIN

UPLIFT, HYDROSTATIC

See WATER PRESSURE

URBAN . . .

See CITIES

UTILITIES

See PUBLIC UTILITIES (cross references thereunder)

VALLEYS (Geographical)

Loup River Basin, Nebr.

"Total Sediment Load Measured in Turbulence Flume," Paul C. Benedict, Maurice L. Albertson and Donald Q. Matejka (with discussion), 457.

VALVES

Binding of butterfly valves in conjunction with concrete movement, 1183, 1185.

Butterfly valves used at Tracy Pumping Plant, in California, 697, 706.

"High-Velocity Tests in a Penstock," Maxwell F. Burke (with discussion), 863.

VEHICLES

See under general types of vehicles, e.g., MOTOR VEHICLES (cross references thereunder)

VEHICULAR TRAFFIC

See TRAFFIC, HIGHWAY AND ROAD (cross reference thereunder)

VEHICULAR TUNNELS

See TUNNELS, VEHICULAR

VELOCITY

See AERODYNAMICS; CURVES (airplane curves); HYDRODYNAMICS; VIBRATION; WATER, FLOW OF . . . ; WIND

VELOCITY DISTRIBUTION

See WATER, FLOW OF . . .

VELOCITY METERS

See WATER VELOCITY METERS (cross reference thereunder)

VENTURI METERS

See METERS AND METERING, VENTURI

VESSELS

See SHIP . . . ; *see also* BARGES

VIBRATION

See also EARTHQUAKES; IMPACT

"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, E. F. Kelley, Raymond Archibald, A. A. Jakkula, Raymond Archibald, C. B. McCullough, G. S. Paxson, F. H. Franklin, C. F. Goodrich, Jonathan Jones, C. Earl Webb, Russell G. Cone, Shortridge Hardesty, Charles M. Spofford, O. L. Grover, E. F. Kelley,

VIBRA-

R.

C.

Ge-

Ka-

Pr-

Ni-

W.

Dr-

An-

Pr-

E.

Ha-

Elas-

be-

Insta-

in-

po-

Inte-

Nati-

br-

"Sa-

El-

Ju-

Sus-

VIB-

T

See-

th-

VISC-

See-

"Fl-

T

"F-

M

"H-

M

8

VOI-

See-

WAI-

See-

WAI-

See-

WAI-

See-

WAI-

See-

VIBRATION (Continued)

R. B. McMinn, Leon S. Moisseiff, C. H. Purcell, Norman C. Raab, George D. Whittle, Theodor von Karman, Frank M. Masters, P. L. Pratley, John G. Little, Leon H. Nishkian, R. W. Crum, Franklin N. Wray, Charles C. Sunderland, H. L. Dryden, G. B. Schubauer, O. H. Ammann, Elmer K. Timby, Emil H. Praeger, F. B. Farquharson, Charles E. Andrew, Glenn B. Woodruff, and Hardy Cross, 721.

Elasto-plastic vibrations of free-free beams, 502.

Instability, noise, flashes and vibration in draft tubes at Martin Dam, Tallapoosa River, in Alabama, 1400, 1406. Interpretation of dynamic records, 951. Natural vibrations of a suspension bridge, 731, 735.

"Sand Compaction by Vibroflotation," Elio D'Appolonia, Callix E. Miller, Jr., and Thomas M. Ware, 154.

Suspension bridges subject to aerodynamic oscillation, in the United States, Canada and Norway, 753, 775.

VIBROFLOTS AND VIBROFLOTATION

See **COMPACTION** (cross references thereunder)

VISCOSITY

See also **WATER, FLOW OF** . . . "Flocculation and Flocculation Basins," Thomas R. Camp, 1.

"Flow in Rough Conduits," Henry M. Morris, Jr. (with discussion), 373.

"High-Velocity Tests in a Penstock," Maxwell F. Burke (with discussion), 863.

VOID RATIO

See **SOILS**

WALLS

See under relative structure or type of wall, e.g., **BULKHEADS**; **RETAINING WALLS**

WAR AND ENGINEERING

See **NATIONAL DEFENSE**; also cross references under **MILITARY ENGINEERS AND ENGINEERING**; **POSTWAR PLANNING**

WASTE DISPOSAL

See **INDUSTRIAL WASTE** (cross references thereunder); **ODORS**; **REFUSE DISPOSAL**; **SANITATION**; **SEWAGE DISPOSAL**; **SEWAGE SLUDGE**; **SEWERS**

WASTE MATERIALS

See cross references under **WASTE DISPOSAL**

WASTE WATER

See **SEWAGE DISPOSAL**; **SEWERS**

WATER . . .

See also **AERATION**; **BACKWATER**; **CAVITATION**; **CONDUITS**; **COSTS** . . . ; **DAMS** (cross references thereunder); **DRAINAGE**; **DRAWDOWN** (cross reference thereunder); **EROSION** . . . ; **FILTERS AND FILTRATION** . . . ; **FLOODS** (cross references thereunder); **FLUMES**; **GOVERNMENT**; **GROUND WATER**; **HYDRAULIC** . . . ; **HYDRO**; **IRRIGATION**; **MARSHES**; **METERS AND METERING** . . . ; **MODELS**, **HYDRAULIC**; **OCEAN** (cross references thereunder); **PIPES AND PIPING** (cross references thereunder); **RAINFALL** (cross references thereunder); **RESERVOIRS**; **RUNOFF**; **SANITATION**; **SEEPAGE**; **SEWAGE DISPOSAL**; **SEWERS**; **STORM WATER** (cross references thereunder); **TANKS** . . . ; **TERMINOLOGY**; **TURBULENCE**; **WAVES**; **WELLS**

WATER COLLECTION

See **INFILTRATION** (cross references thereunder); **WELLS**

WATER DISTRIBUTION

See **CANALS**; **CONDUITS**; **IRRIGATION**

WATER FILTERS AND FILTRATION

See **FILTERS AND FILTRATION**, **WATER**

WATER, FLOW OF (General)

See also **FLOODS** (cross references thereunder); **FLUMES**; **FRICITION** . . . ; **GROUND WATER**; **HYDRAULICS**; **LIQUIDS, FLOW OF**; **MODELS**, **HYDRAULIC**; **TURBULENCE**; **VALVES**; **VISCOSITY**; **WATER GATES**, **MOVABLE**; **WATER HAMMER**; **WELLS**

"Applications of the Relaxation Technique in Fluid Mechanics," John S. McNown, En-Yun Hsu and Chia-Shun Yih, 650. *Discussion*: Fred W. Blaisdell; Henry M. Paynter and Ronald F. Scott; Mladen Boreli;

WATER, FLOW OF (General)
(Continued)

Turgut Sarpkaya; and John S. Mc-
Nown, En-Yun Hsu and Chia-Shun
Yih, 670.

Basic types of flow, including wake
interference flow, 373, 377, 403.

"Flow in Rough Conduits," Henry M.
Morris, Jr., 373. *Discussion:* Victor
L. Streeter, Walter Rand, Harry H.
Ambrose, and Henry M. Morris, Jr.,
399.

WATER, FLOW OF, IN FLUMES

See WATER, FLOW OF, IN OPEN
CHANNELS

**WATER, FLOW OF, IN OPEN
CHANNELS**

See also BACKWATER; SEDI-
MENT AND SEDIMENTATION;
SILT AND SILTING, CHAN-
NEL; WAVES

"Backwater Effects of Open-Channel
Constrictions," Hubert J. Tracy and
Rolland W. Carter, 993. *Discussion:*
Paul V. Hodges; Carl F. Izzard;
Harold R. Henry; and Hubert J.
Tracy and Rolland W. Carter, 1007.

"Backwater Functions by Numerical
Integration," Clint J. Keifer and
Henry H. Chu (with discussion),
429.

Channels having nonuniform discharge,
255.

Computing backwater from channel ob-
structions caused by bridge piers,
1007, 1008, 1013.

Constriction geometry in open channel
flow, 993.

Equation based on the conservation of
momentum and its successful use in
the study of hydraulic jump, 256.

"Flocculation and Flocculation Basins,"
Thomas R. Camp, 1.

"Flow in Rough Conduits," Henry M.
Morris, Jr. (with discussion), 373.

Geometry of open channel constrictions,
955.

"Motion of Particles on Bed of a Tur-
bulent Stream," Arthur T. Ippen and
Ramjee P. Verma, 921.

"Open Channels with Nonuniform Dis-
charge," Wen-Hsiung Li, 255. *Dis-
cussion:* Turgut Sarpkaya and Wen-
Hsiung Li, 275.

Three reports on water flow through
bridge openings, 991, 994.

"Total Sediment Load Measured in
Turbulence Flume," Paul C. Bene-

dict, Maurice L. Albertson and Don-
ald Q. Matejka (with discussion),
457.

Tractive force distribution from veloc-
ity distribution, 1234.

"Tranquill Flow through Open-Channel
Constrictions," Carl E. Kindsvater
and Rolland W. Carter, 955. *Dis-
cussion:* Emmett M. Laursen and
Arthur Toch; Fred W. Blaisdell;
Pin-nam Lin; Carl F. Izzard; Ches-
ley J. Posey; and Carl E. Kindsvater
and Rolland W. Carter, 981.

Usage of baffles and battens to force
sediment dunes into suspension, 457,
462, 463.

Bibliography

Review of literature on theory and
methods of computing flow, 957.

WATER, FLOW OF, IN PIPES

See also PIPE LINES; PIPES AND
PIPING (cross references there-
under); PUMPS AND PUMPING;
SEWERS; WATER HAMMER;
WATER PRESSURE

"Flow in Rough Conduits," Henry M.
Morris, Jr. (with discussion), 373.

"High-Velocity Tests in a Penstock,"
Maxwell F. Burke (with discussion),
863.

"Hydraulic Model Studies of Martin
Dam Draft Tubes," Carl E. Kinds-
vater and Richard R. Randolph, Jr.
(with discussion), 1399.

WATER, FLOW OF, IN TANKS

See WATER, FLOW OF, IN OPEN
CHANNELS

**WATER, FLOW OF, THROUGH
ORIFICES**

"Applications of the Relaxation Tech-
nique in Fluid Mechanics," John S.
McNown, En-Yun Hsu and Chia-
Shun Yih (with discussion), 650.

"Effect of Well Screens on Flow into
Wells," Jack S. Petersen, Carl Roh-
wer and Maurice L. Albertson (with
discussion), 563.

"High-Velocity Tests in a Penstock,"
Maxwell F. Burke (with discussion),
863.

The orifice analogy for open channel
constrictions, 961.

WATER GATES, MOVABLE

"Discharge Characteristics of Tainter
Gates," Arthur Toch, 290.

WATER, GROUND

See GROUND WATER

WATER HAMMER

See also COSTS, WATER HAMMER ANALYSIS; WATER PRESSURE

Charts for solution of water hammer problems, 697, 713.

"Pressure Surges in Pump Installations," John Parmakian, 697. *Discussion:* Carroll E. Withers, Peter Linton, and John Parmakian, 717.

WATER INSTRUMENTS

See under types of instruments, e.g., GAGES . . . ; METERS AND METERING . . .

WATER LAW

See LAW subject heading under WATER . . . , e.g., WATERWAY LAW

WATER METERS AND METERING (stream velocity)

See METERS AND METERING, CURRENT

WATER PIPES AND PIPING

See PIPES AND PIPING (cross references thereunder)

WATER POWER (General)

See MULTI-PURPOSE PROJECTS (RIVER PROJECTS); POWER PLANTS; TURBINES, WATER

WATER PRESSURE

See also GAGES, PRESSURE; PIPE LINES; WATER HAMMER

"Applications of the Relaxation Technique in Fluid Mechanics," John S. McNown, En-Yun Hsu and Chia-Shun Yih (with discussion), 650.

"Hydraulic Model Studies of Martin Dam Draft Tubes," Carl E. Kinds-vater and Richard R. Randolph, Jr. (with discussion), 1399.

"Reduction in Soil Strength with Increase in Density," Charles R. Foster (with discussion), 803.

"Strength Characteristics of Compacted Clays," Gerald A. Leonards (with discussion), 1420.

"The Undisturbed Consolidation Behavior of Clay," John H. Schmertmann (with discussion), 1201.

WATER, STORM

See DRAINAGE; SEWAGE DISPOSAL; SEWERS

WATER SUPPLY (General)

See also FILTERS AND FILTRATION, WATER; GROUND WATER; IRRIGATION; METERS

AND METERING; PIPE LINES; PUMPS AND PUMPING; SETTLING BASINS; WATER . . . (related subject headings thereunder); WELLS

"Effect of Well Screens on Flow into Wells," Jack S. Petersen, Carl Rohwer and Maurice L. Albertson (with discussion), 563.

WATER SURFACE PROFILES

See BACKWATER

WATER SURFACE SURGES

See WATER HAMMER; WAVES

WATER THROW

See JETS (cross reference thereunder)

WATER TRAJECTORY

See JETS (cross reference thereunder)

WATER TRANSPORTATION (General)

See also CANALS; COSTS, WATER TRANSPORTATION; FREIGHT; HARBORS; RIVERS; TRAFFIC . . . ; TUNNELS, VEHICULAR; WATERWAYS

The "Commerce Clause" in the United States Constitution, 1537.

WATER TRANSPORTATION (Geographical)**United States**

"Some Economic Aspects of Water-way Projects," Haywood R. Faison (with discussion), 1480.

WATER TREATMENT

See also FILTERS AND FILTRATION, WATER

"Flocculation and Flocculation Basins," Thomas R. Camp, 1.

WATER TURBINES

See TURBINES, WATER

WATER, UNDERGROUND

See GROUND WATER

WATER VELOCITY METERS

See METERS AND METERING, CURRENT

WATER, WASTE

See SEWAGE DISPOSAL; SEWERS

WATER WAVES

See WAVES

WATERWAY LAW

United States Supreme Court decision and 82nd Congress legislation pending relating to inland waterway rate making and other problems, 1515, 1520.

WATERWAYS (General)

See also CANALS; CHANNELS; COSTS . . . ; FREIGHT; HARBOURS; OCEAN . . . (cross references thereunder); RIVERS; SEA . . . (cross references thereunder); TRAFFIC, WATERWAY; WATER TRANSPORTATION

Financing

"Some Economic Aspects of Waterway Projects," Haywood R. Faison (with discussion), 1480.

WATERWAYS (Geographical)**Illinois Waterway**

Economic aspects and history of the Illinois Waterway, 1480, 1489.

United States

Report of Engineers Joint Council (EJC) committee on national water policy recommendations criticized and defended, 1496, 1544.

"Some Economic Aspects of Waterway Projects," Haywood R. Faison, 1480. *Discussion:* Duane Orr; L. Perry Cunningham; Marvin B. Marsh; Owen G. Stanley; Herman W. Schull, Jr.; Nels C. Magnuson; Braxton B. Carr; Cyril E. Childe; Francis J. Wilson and Newton R. Graham; Charles L. Hall; James W. Davis; and Haywood R. Faison, 1526.

WATERWAY TRAFFIC

See TRAFFIC, WATERWAY

WATER TRAJECTORY

See JETS (cross reference thereunder)

WATERWAY TRANSPORTATION

See WATER TRANSPORTATION

WATERWORKS (General)

See DAMS (cross references thereunder); ENGINES; METERS AND METERING; VENTURI; PIPE LINES; PIPES AND PIPING (cross references thereunder); PUMPS AND PUMPING; SEDIMENT AND SEDIMENTATION; WATER SUPPLY; WATER TREATMENT; WELLS

WAVES

See also SEISMOLOGY; TIDES; WATER PRESSURE

Relaxation method usage in determining certain types of wave motion, including seiche, 651, 681, 686.

WEATHER

See ATMOSPHERIC PRESSURE; FLOODS (cross references there-

under); HYDROLOGY (cross references thereunder); RAINFALL (cross references thereunder); TEMPERATURE; WIND . . .

WEATHER BUREAU, UNITED STATES

See under relative subject, e.g., FLOODS (cross references thereunder); WIND . . .

WEBS

See BEAMS

WEIGHTS

See under relative subject, e.g., BRIDGES, SUSPENSION

WEIRS

See LIQUIDS, FLOW OF, OVER WEIRS; WATER, FLOW OF, IN OPEN CHANNELS; WATER, FLOW OF, IN PIPES

WELDED JOINTS

See JOINTS, WELDED

WELDS AND WELDING

See also COSTS, WELD AND WELDING; METALS (cross references thereunder)

Specifications controlling welding of structural steel, 236, 244.

"Welded Structures": A Symposium, Simon A. Greenberg, La Motte Grover, and C. L. Kreidler, 103. *Discussion:* Jack R. Benjamin, George W. Lamb, F. J. Tamanini, Norman B. Jones, and La Motte Grover, 112.

Inspection

Radiographic inspection in bridge welding, 242.

"Structural Welding Inspection," John L. Beaton and Paul G. Jonas, 235.

Uses of penetrant dye method of inspection, 240.

WELLS

See also GROUND WATER

"Applications of the Relaxation Technique in Fluid Mechanics," John S. McNown, En-Yun Hsu and Chia-Shun Yih (with discussion), 650.

Early law and interstate control of oil and gas in the United States, 496, 498.

"Effect of Well Screens on Flow into Wells," Jack S. Petersen, Carl Rohwer and Maurice L. Albertson, 563. *Discussion:* Wen-Hsiung Li; Arthur L. Collins; Mohammad Nazir and Nazir Ahmad; Matthew I. Rorabaugh; Dean F. Peterson, Jr.; G. Cohen de Lara; Gerard Tison, Jr.;

WELL

and
and
Test
flow
571

WHE

"Str
Cr
Ch

WIN

"See
B
so
S
R
R
l
l
C
S
S
G
G

WELLS (*Continued*)

and Jack S. Petersen, Carl Rohwer, and Maurice L. Albertson, 586.

Test apparatus for determining water flow into and through well screens, 571, 573, 593.

WHEEL LOADS

"Stress Measurements, San Leandro Creek Bridge," Ray W. Clough and Charles F. Scheffey, 939.

WIND (General)

See also WAVES

"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, E. F. Kelley, Raymond Archibald, A. A. Jakkula, Raymond Archibald, C. B. McCullough, G. S. Paxson, F. H. Frankland, C. F. Goodrich, Jonathan Jones, C. Earl Webb, Russell G. Cone, Shortridge Hardesty, Charles M. Spofford, O. L. Grover, E. F. Kelley, R. B. McMinn, Leon S. Moisseiff, C. H. Purcell, Norman C. Raab, George D. Whittle, Theodor von Karman, Frank M. Masters, P. L. Pratley, John G. Little, Leon H. Nishkian, R. W. Crum, Franklin N. Wray, Charles C. Sunderland, H. L. Dryden, G. B. Schubauer, O. H. Ammann, Elmer K. Timby, Emil H. Praeger, F. B. Farquharson, Charles E. Andrew, Glenn B. Woodruff, and Hardy Cross, 721.

High frequency hurricane localities, in United States, 1900-1951, 178.

Hurricane recording by the United States Weather Bureau, including gust factor, 173, 175.

Maximum velocities recorded for hurricane winds, including gusts, 174, 179. "Wind Velocities during Hurricanes," Robert C. Gentry, 169.

WIND MEASURING INSTRUMENTS

Designing and using wind measuring instruments in extremely high winds, 173.

Methods of using anemometers, 174, 176.

WIND PRESSURE

See AERODYNAMICS; STRUCTURES, THEORY OF—Bridges

WIRE ROPES AND ROPING

See CABLES . . . (cross reference thereunder)

WORK, COST OF

See COSTS

WORKS (industrial buildings and equipment)

See under general types of works, e.g., PUBLIC WORKS (cross reference thereunder); also under specific type of works, e.g., GAS AND GAS-WORK . . . ; SEWAGE WORKS (cross references thereunder); WATERWORKS (cross references thereunder); *see also* cross references under PLANTS

AUTHOR INDEX

(including *Memoirs of deceased members*)

Ahmad, Nazir
Well screens, 593.

Albertson, Maurice L.
"Effect of Well Screens on Flow into Wells," 563.
"Total Sediment Load Measured in Turbulence Flume," 457.

Ambrose, Harry H.
Rough conduits, 402.

Ammann, O. H.
"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 768.

Anderson, Boyd G.
Cylindrical shell roofs, 646.

Anderson, Norval
"Sewage Aeration Practice in Chicago," 351.

Andrew, Charles E.
"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 768.

Archibald, Raymond
"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 767.

Ashdown, Alfred J.
Inelastic behavior, 205.

Aslakson, Carl I.
"The Importance of Shoran Surveying," 225.

Baker, J. F.
Plastic strength, 1104.

Ball, Ethan F.
"Chesapeake Bay Bridge," 245.

Barber, Edward S.
Soil strength, 816.

Baron, Frank
"High-Strength Bolts in Structural Joints (symposium): Comparison of Bolted and Riveted Joints," 1322.
"Plastic Strength of Structural Members (symposium): Foreword," 1020.

Beaton, John L.
"Structural Welding Inspection," 235.

Beedle, Lynn S.
Plastic strength, 1097.
"Plastic Strength of Structural Members (symposium): Foreword," 1020.
"Plastic Strength of Structural Members (symposium): Plastic Deformation of Wide-Flange Beam-Columns," 1028.

Benedict, Paul C.
"Total Sediment Load Measured in Turbulence Flume," 457.

Benjamin, Jack R.
Welded structures, 134.

Bennett, Preston T.
Compacted clays, 1467.

Berndt, Neil R.
"Transit Lining of High-Speed Track," 521.

Bijlaard, Paul P.
Plastic strength, 1156.
"Plastic Strength of Structural Members (symposium): Eccentrically Loaded, End-Restrained Columns," 1070.

Blaisdell, Fred W.
Open channel constrictions, 981.
Relaxation techniques, 670.

Blee, Clarence E.
Hydroelectric plants, 558.

Bleich, Hans H.
"Impulsive Motion of Elasto-Plastic Beams," 499.

Blodget, Lorin Theodore
Memoir of, 1558.

Blum, Louis Philip
Memoir of, 1559.

Bolton, Frank Leonard
Memoir of, 1560.

Boreli, Mladen
Relaxation techniques, 677.

Borland, W. M.
Turbulence flumes, 485.

Bose, N. K.
Stable channels, 1269.

Brady, W. Gordon
"Plastic Strength of Structural Members (symposium): Investigation and Limit Analysis of Net Area in Tension," 1133.

Braudeau, G.
Stable channels, 1266.

Bresler, Boris
Inelastic behavior, 203.

Burke, Maxwell F.
"High-Velocity Tests in a Penstock," 863.

Butcher, Harold Edgar
Memoir of, 1560.

Camp, Thomas R.
"Flocculation and Flocculation Basins," 1.

Campbell, Frank B.
Penstock tests, 887.

Carr, Braxton B.
Waterway economics, 1538.

Carter, Jack W.
"High-Strength Bolts in Structural Joints (symposium): Fatigue in Riveted and Bolted Single-Lap Joints," 1353.

Carter, Rolland W.
"Backwater Effects of Open-Channel Constrictions," 993.
"Tranquil Flow through Open-Channel Constrictions," 955.

Childe, Cyril E.
Waterway economics, 1539.

Chin, A. G.
"High-Strength Bolts in Structural Joints (symposium): Slip of Joints under Static Loads," 1335.

Chu, Henry H.
"Backwater Functions by Numerical Integration," 429.

Chung, Randall
"Constrained Circular Beams on Elastic Foundations," 301.

Clapper, Leland
Memoir of, 1561.

Clark, John W.
"Plastic Strength of Structural Members (symposium): Eccentrically Loaded Aluminum Columns," 1116.

Clough, Ray W.
"Stress Measurements, San Leandro Creek Bridge," 939.

Collins, Arthur L.
Penstock tests, 888.
Well screens, 590.

Cone, Russell G.
"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 767.

Cookingham, L. Perry
Waterway economics, 1528.

Corbett, W. H.
Turbulence flumes, 485.

Crisp, Robert L., Jr.
Undisturbed consolidation, 1228.

Cross, Hardy
"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 768.

Crum, R. W.
"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 768.

Curtis, Allen J.
"Photoelastic Analogy for Nonhomogeneous Foundations," 35.

D'Appolonia, Elio
"Sand Compaction by Vibroflotation," 154.

Davis, Harmer E.
"Issues in Highway Engineering Education," 340.

Davis, James W.
Waterway economics, 1545.

Degenkolb, Henry J.
"Structural Observations of the Kern County Earthquake," 1280.

de Lara, G. Cohen
Well screens, 598.

Dempster, Osborne Joel
Memoir of, 1561.

de Vries, Karl
High strength bolts, 1381.

Dougherty, John Wilson
Memoir of, 1562.

Drucker, Daniel C.
"Plastic Strength of Structural Members (symposium): Foreword," 1020.

Drucker, Daniel C. (Continued)
 "Plastic Strength of Structural Members (symposium): Investigation and Limit Analysis of Net Area in Tension," 1133.

Dryden, H. L.
 "Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 768.

Ernst, G. C.
 Cylindrical shell roofs, 644.

Escoffier, Francis F.
 Backwater functions, 443.

Faison, Haywood R.
 "Some Economic Aspects of Waterway Projects," 1480.

Farquharson, F. B.
 "Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 768.

Fisher, Gordon P.
 "Plastic Strength of Structural Members (symposium): Eccentrically Loaded, End-Restrained Columns," 1070.

Foster, Charles R.
 "Reduction in Soil Strength with Increase in Density," 803.

Francis, A. J.
 High strength bolts, 1319.

Frankland, F. H.
 "Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 767.

Frankland, James
 Memoir of, 1563.

Fuller, Almon H.
 Stress measurement, 336.

Furbank, Arthur W.
 Municipal composting, 916.

Gandolfo, Jose S.
 Stable channels, 1271.

Garlinghouse, Leslie Holmes
 Memoir of, 1563.

Gentry, Robert C.
 "Wind Velocities during Hurricanes," 169.

Gibbs, Harold J.
 Compacted clays, 1455.

Giesecke, Frederick Ernest
 Memoir of, 1564.

Glidden, William R.
 "Backsights and Foresights—Glimpses Ahead in the Light of History as Directed by Science": Address at the Summer Convention, St. Louis, Mo., June 15, 1955, 1550.

Goodman, Lawrence E.
 "Ascismic Design of Firmly Founded Elastic Structures," 782.

Goodrich, C. F.
 "Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 767.

Gosline, George Williams
 Memoir of, 1564.

Gotaas, Harold B.
 "Stabilization of Municipal Refuse by Composting," 897.

Graham, Newton R.
 Waterway economics, 1542.

Greenberg, Simon A.
 "Welded Structures (symposium): Steel Requirements," 104.

Griffiths, John D.
 "Plastic Strength of Structural Members (symposium): Foreword," 1020.

Grover, La Motte
 "Welded Structures (symposium): Design and Research," 112.

Grover, O. L.
 "Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 767.

Gunn, Donald
 Memoir of, 1565.

Hall, Charles L.
 Waterway economics, 1543.

Halton, George R.
 Soil strength, 817.

Hammond, Harry Parker
 Memoir of, 1566.

Hansen, O. C.
 Turbulence flumes, 485.

Hansen, Viggo
 "Movements in Structural Concrete in a Powerhouse," 1183.

Hardesty, Shortridge
 "Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 767.

Harding, S. T.
"Statutory Control of Ground Water in the Western United States," 490.

Hardman, Roy Cordis
Memoir of, 1566.

Hechtman, R. A.
"High-Strength Bolts in Structural Joints (symposium): Slip of Joints under Static Loads," 1335.

Heindel, Judson Clifford
Memoir of, 1567.

Henry, Harold R.
Open channel constrictions, 1013.

Higgins, T. R.
"High-Strength Bolts in Structural Joints (symposium): Structural Uses of High-Strength Bolts," 1389.

Hilf, Jack W.
Compacted clays, 1455.

Hodges, Paul V.
Open channel constrictions, 1007.

Hognestad, Eivind
"Plastic Strength of Structural Members (symposium): Foreword," 1020.

Homack, Peter
Biofiltration plants, 836.

Horne, Michael R.
Lateral buckling, 1179.
Plastic strength, 1104.

Horonjeff, Robert
"Determination of Radii of Curvature of Taxiways," 27.

Howard, Ernest Emmanuel
Memoir of, 1558.

Hoyer, Carl O.
"Industrial Development in the South," 411.

Hsu, En-Yun
"Applications of the Relaxation Technique in Fluid Mechanics," 650.

Hutchinson, Frank
Memoir of, 1568.

Hyatt, Edward
Memoir of, 1568.

Ippen, Arthur T.
"Motion of Particles on Bed of a Turbulent Stream," 921.

Izzard, Carl F.
Open channel constrictions, 985, 1008.

Jakkula, A. A.
"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 767.

James, R. L.
"Plastic Strength of Structural Members (symposium): Foreword," 1020.

Jeffers, Paul Eells
Memoir of, 1569.

Jessop, George A.
Hydroelectric plants, 559.

Johnson, Frank Arthur
Memoir of, 1569.

Johnston, Bruce G.
"Analysis and Tests of a Cylindrical Shell Roof Model," 615.
"Plastic Strength of Structural Members (symposium): Foreword," 1020.

Jonas, Paul G.
"Structural Welding Inspection," 235.

Jones, John H.
"Determination of Radii of Curvature of Taxiways," 27.

Jones, Jonathan
"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 767.
"Erection of Main River Span, Passaic River Bridge," 208.

Jones, Norman B.
Welded structures, 143.

Jones, Owen Meriwether
Memoir of, 1570.

Kaminsky, Edmund L.
"Plastic Strength of Structural Members (symposium): Plastic Deformation of Wide-Flange Beam-Columns," 1028.

Kammer, Herbert A.
Concrete movement, 1196.

Kampmeier, Roland A.
Southern industry, 422.

Kaufman, Vivian Gregor
Memoir of, 1571.

Keifer, Clint J.
"Backwater Functions by Numerical Integration," 429.

Kelley, E. F.
"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 767.

Ketter, Robert L.
"Plastic strength, 1097.
"Plastic Strength of Structural Members (symposium) : Plastic Deformation of Wide-Flange Beam-Columns," 1028.

Kindswater, Carl E.
"Hydraulic Model Studies of Martin Dam Draft Tubes," 1399.
"Tranquil Flow through Open-Channel Constrictions," 955.

Kluge, Ralph W.
"Dead-Load Stress Measurement in a Long Span Bridge," 311.

Kolupaila, Steponas
Penstock tests, 884.

Kreidler, C. L.
"Welded Structures (symposium) : Fabrication and Construction," 147.

Lagaard, Maurice B.
"Dead-Load Stress Measurement in a Long Span Bridge," 311.

Lamb, George W.
Welded structures, 135.

Lane, Emory W.
"Design of Stable Channels," 1234.

Larson, Edward W., Jr.
"Dead-Load Stress Measurement in a Long Span Bridge," 311.
"High-Strength Bolts in Structural Joints (symposium) : Comparison of Bolted and Riveted Joints," 1322.

Laursen, Emmett M.
Open channel constrictions, 981.

Lee *See also* Li

Lee, Lawrence H. N.
"Inelastic Behavior of Reinforced Concrete Members," 181.

Leliavsky, Serge
Stable channels, 1261.

Lenzen, Kenneth H.
"Dead-Load Stress Measurement in a Long Span Bridge," 311.
"High-Strength Bolts in Structural Joints (symposium) : Fatigue in Riveted and Bolted Single-Lap Joints," 1353.

Leonards, Gerald A.
"Strength Characteristics of Compacted Clays," 1420.

Li. *See also* Lee

Li, Wen-Hsiung
"Open Channels with Nonuniform Discharge," 255.
Well screens, 586.

Lin, Pin-Nam
Open channel constrictions, 982.

Linton, Peter
Pressure surges, 717.

Little, John G.
"Aerodynamic Stability of Suspension Bridges" : 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 768.

Lowden, Spencer William
Memoir of, 1571.

Lundquist, Eugene E.
"Plastic Strength of Structural Members (symposium) : Foreword," 1020.

Magnuson, Nels C.
Waterway economics, 1537.

Mannes, Conrad Olai
Memoir of, 1572.

Marsh, Marvin B.
Waterway economics, 1530.

Masters, Frank M.
"Aerodynamic Stability of Suspension Bridges" : 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 768.

Matejka, Donald Q.
"Total Sediment Load Measured in Turbulence Flume," 457.

McCammon, Lewis B., Jr.
"Dead-Load Stress Measurement in a Long Span Bridge," 311.

McCullough, C. B.
"Aerodynamic Stability of Suspension Bridges" : 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 767.

McGauhey, Percy H.
"Stabilization of Municipal Refuse by Composting," 897.

McMinn, R. B.
"Aerodynamic Stability of Suspension Bridges" : 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 767.

McNown, John S.
"Applications of the Relaxation Technique in Fluid Mechanics," 650.

Menninick, Howard K.
"The Training of City Planners," 608.

Meyer, Adolf A.
"Modernization of the Hales Bar Plant," 539.

Middlebrooks, Thomas Alwyn
Memoir of, 1572.

Miles, Henry J.
Backwater functions, 444.

Miller, Callix E.
"Sand Compaction by Vibroflotation," 154.

Mitchell, James K.
Compacted clays, 1462.

Moisseiff, Leon S.
"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 767.

Morris, Henry M., Jr.
"Flow in Rough Conduits," 373.

Moyer, Ralph A.
"Issues in Highway Engineering Education," 340.

Moyer, Stanley
"Movements in Structural Concrete in a Powerhouse," 1183.

Munse, William H.
"High-Strength Bolts in Structural Joints (symposium); Laboratory Tests of Bolted Joints," 1299.
Plastic strength, 1155.
"Plastic Strength of Structural Members (symposium): Foreword," 1020.

Nazir, Mohammad
Well screens, 593.

Newmark, Nathan M.
"Aseismic Design of Firmly Founded Elastic Structures," 782.
"High-Strength Bolts in Structural Joints (symposium): Laboratory Tests of Bolted Joints," 1299.

Nishkian, Leon H.
"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 768.

Nizer, A.
Stable channels, 1266.

Noble, Charles M.
"Planning and Operating Turnpikes," 54.

Oesterblom, I.
Circular beams, 87.

Oliver, Emery
Memoir of, 1573.

Orr, Duane
Waterway economics, 1526.

Palmer, Ralph Mallory
Memoir of, 1574.

Parmakian, John
"Pressure Surges in Pump Installations," 697.

Paxson, G. S.
"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 767.

Paynter, Henry M.
Relaxation techniques, 671.

Peraino, Joseph
"Construction of the Elizabeth River Tunnel," 423.

Petersen, Jack S.
"Effect of Well Screens on Flow into Wells," 563.

Peterson, Dean F., Jr.
Well screens, 597.

Posey, Chesley J.
Open channel constrictions, 990.

Præger, Emil H.
"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 768.

Pratley, P. L.
"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 768.

Prince, Harry C.
High strength bolts, 1382.

Prokosch, Walther
"Traffic at an International Airport," 364.

Purcell, C. H.
"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 767.

Raab, Norman C.
"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 768.

Rand, Walter
Rough conduits, 400.

Randolph, Richard R., Jr.
"Hydraulic Model Studies of Martin Dam Draft Tubes," 1399.

Rankin, Renville S.
"Evaluation of the Performance of Biofiltration Plants," 823.

Reed, Oren
Memoir of, 1574.

Rich, George R.
Hydroelectric plants, 557.

Richard, F. E., Jr.
"Photoelastic Analogy for Nonhomogeneous Foundations," 35.

Riley, Russell H.
"Community and Neighborhood Development," 449.

Roberts, Leo Bond
Memoir of, 1575.

Rohwer, Carl
"Effect of Well Screens on Flow into Wells," 563.

Root, Arthur W.
"Correction of Landslides and Slip-outs," 281.

Rorabaugh, Matthew I.
Well screens, 595.

Rosenblueth, Emilio
"Aseismic Design of Firmly Founded Elastic Structures," 782.

Rubey, Harry
Transit lining of railway curves, 538.

Ruble, E. J.
"High-Strength Bolts in Structural Joints (symposium): Structural Uses of High-Strength Bolts," 1389.

Ryan, Robert Laurence
Memoir of, 1575.

Salovaara, Jorma J.
City planners and education, 613.

Salvadori, Mario G.
"Impulsive Motion of Elasto-Plastic Beams," 499.
"Lateral Buckling of I-Beams," 1165.

Sarpkaya, Turgut
Open channels, 275.
Relaxation techniques, 681.

Savikko, E. R.
"High-Strength Bolts in Structural Joints (symposium): Slip of Joints under Static Loads," 1335.

Scheffey, Charles F.
"Stress Measurements, San Leandro Creek Bridge," 939.

Schmertmann, John H.
"The Undisturbed Consolidation Behavior of Clay," 1201.

Schubauer, G. B.
"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 768.

Schull, Herman W., Jr.
Waterway economics, 1536.

Schultz, Edward A.
"Sediment Sampling in Tidal Waterways," 687.

Scott, Ronald F.
Relaxation techniques, 671.

Shea, Paul H.
"Unusual Foundation Conditions in the Everglades," 92.

Shuptrine, Harry Augustus
Memoir of, 1576.

Sill, Rush Tabor
Memoir of, 1576.

Silvester, Richard
Backwater functions, 445.

Snodgrass, George F.
"Selection and Design of High-Volume, Low-Head Pumps," 17.

Spofford, Charles M.
"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 767.

Stanley, Owen G.
Waterway economics, 1532.

Stewart, W. C.
"High-Strength Bolts in Structural Joints (symposium): History of the Use of High-Strength Bolts," 1296.

Streeter, Victor L.
Rough conduits, 399.

Sunderland, Charles C.
"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 768.

Swift, William Everett
Memoir of, 1577.

Symonds, P. S.
Elasto-plastic beams, 516.
"Plastic Strength of Structural Members (symposium): Foreword," 1020.

Tabor, Henry Whitney
Memoir of, 1578.

Tamanini, F. J.
Welded structures, 140.

Teeter, Earle Everett
Memoir of, 1578.

Thurlimann, Bruno
"Analysis and Tests of a Cylindrical Shell Roof Model," 615.

Timby, Elmer K.
"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 768.

Tison, Gerard, Jr.
Well screens, 601.

Toch, Arthur
"Discharge Characteristics of Tainter Gates," 290.
Open channel constrictions, 981.

Tracy, Hubert J.
"Backwater Effects of Open-Channel Constrictions," 993.

Trimble, William Foster, Jr.
Memoir of, 1579.

Verma, Ramjee P.
"Motion of Particles on Bed of a Turbulent Stream," 921.

Volterra, Enrico
"Constrained Circular Beams on Elastic Foundations," 301.
"Deflections of a Circular Beam Out of Its Initial Plane," 65.

von Karman, Theodor
"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 768.

Ware, Thomas M.
"Sand Compaction by Vibroflotation," 154.

Webb, C. Earl
"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 767.

Whitman, Robert V.
Lateral buckling, 1178.

Whitney, Charles S.
Cylindrical shell roofs, 645.

Whittle, George D.
"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 767.

Wilson, Francis J.
Waterway economics, 1542.

Winter, George
Plastic strength, 1062.
"Plastic Strength of Structural Members (symposium): Eccentrically Loaded, End-Restrained Columns," 1070.
"Plastic Strength of Structural Members (symposium), Foreword," 1020.

Withers, Carroll E.
Pressure surges, 717.

Wohlt, Paul E.
Compacted clays, 1467.

Wood, Dana Melvin
Memoir of, 1579.

Woodhead, E. A.
Concrete movement, 1193.

Woodruff, Glenn B.
"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 768.
High strength bolts, 1381.

Woodruff, Richard S.
Draft tubes, 1416.

Wray, Franklin N.
"Aerodynamic Stability of Suspension Bridges": 1952 Report of the Advisory Board on the Investigation of Suspension Bridges, 768.

Wright, D. T.
"High-Strength Bolts in Structural Joints (symposium): Laboratory Tests of Bolted Joints," 1299.

Wyl, Lawrence T.
"Dead-Load Stress Measurement in a Long Span Bridge," 311.
"High-Strength Bolts in Structural Joints (symposium): Fatigue in Riveted and Bolted Single-Lap Joints," 1353.

Yeo, William Herbert Watt
Memoir of, 1580.

Yih, Chia-Shun

"Applications of the Relaxation Technique in Fluid Mechanics," 650.

Young, D. R.

"High-Strength Bolts in Structural Joints (symposium): Slip of Joints under Static Loads," 1335.

Youngquist, R. Clifford

Penstock tests, 893.

Zack, Samuel I.

"Financing of Sewage Works in Pennsylvania," 843.

in Penn-